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ABSTRACT

In addition to scores on the Graduate Management Admission Test (GMAT), which are required of applicants to a substantial number of graduate management schools, foreign candidates may also be required to submit scores on the Test of English as a Foreign Language (TOEFL) as an indication of English language proficiency. The present study provides an analysis of the relationships among TOEFL and GMAT total scores and subscores for a large sample of foreign GMAT candidates. The sample included GMAT candidate files from September 1977 to August 1979 of candidates (1) who were not United States citizens; (2) whose language of greatest fluency was not English; and (3) who had taken TOEFL between 1977 and 1979. Scatterpoints were generated for samples of candidates for each of the least-squares regression analyses. The results suggest that the apparent "discrepancies" between TOEFL scores and GMAT verbal scores are, because of differences in score scales, norming populations, intended purposes, and levels of difficulty, to be expected. The relationships (and "discrepancies") between TOEFL and GMAT scores are relatively similar for candidates from several countries. (Author/PN)

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THE RELATIONSHIP BETWEEN SCORES ON THE GRADUATE MANAGEMENT ADMISSION TEST AND THE TEST OF ENGLISH AS A FOREIGN LANGUAGE

Donald E. Powers

U.S. DEPARTMENT OF EDUCATION
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The Test of English as a Foreign Language (TOEFL) was developed in 1963 by a National Council on the Testing of English as a Foreign Language, which was formed through the cooperative effort of over thirty organizations, public and private, that were concerned with testing the English proficiency of non-native speakers of the language applying for admission to institutions in the United States. In 1965, Educational Testing Service (ETS) and the College Board assumed joint responsibility for the program and in 1973 a cooperative arrangement for the operation of the program was entered into by ETS, the College Board, and the Graduate Record Examinations Board. The membership of the College Board is composed of schools, colleges, school systems, and educational associations; Graduate Record Examinations Board members are associated with graduate education.

ETS administers the TOEFL program under the general direction of a Policy Council that was established by, and is affiliated with, the sponsoring organizations. Members of the Policy Council represent the College Board and the Graduate Record Examinations Board and such institutions and agencies as graduate schools of business, junior and community colleges, nonprofit educational exchange agencies, and agencies of the United States government.

The Relationship Between Scores on the Graduate Management Admission Test and the Test of English as a Foreign Language

Donald E. Powers

Educational Testing Service
Princeton, N.J.

RR 80-31

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Abstract

In addition to scores on the Graduate Management Admission Test (GMAT), which are required of applicants to a substantial number of graduate management schools, foreign candidates may also be required to submit scores on the Test of English as a Foreign Language (TOEFL) as an indication of English language proficiency.

The present study provides an analysis of the relationships among TOEFL and GMAT total scores and subscores for a large sample of foreign GMAT candidates. The results suggest that the apparent "discrepancies" between TOEFL scores and GMAT verbal scores are, because of differences in score scales, norming populations, intended purposes, and levels of difficulty, to be expected. The relationships (and "discrepancies") between TOEFL and GMAT scores are relatively similar for candidates from several countries.

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Introduction

A substantial number of foreign students apply each year to graduate management schools located in the United States in order to pursue studies in management or other business-related fields. For the 1977-78 Graduate Management Admission Test (GMAT) processing year, 38,448, or 21.6 percent of the total number of candidates who took the GMAT, reported that they were citizens of countries other than the United States.[1]

Information that is supplied to prospective graduate management students suggests that most schools generally welcome applications from foreign students, but that these schools expect foreign applicants to meet the same admission standards that are set for everyone else.

Some schools, however, do accept on a nondegree basis foreign students whose English proficiency is substantially less than that of native speakers. Most graduate management schools require students whose undergraduate training was not conducted in English to demonstrate their ability to understand rapidly spoken idiomatic English; to participate actively in discussions; to read widely and quickly; and to write reports and other material. Scores on the Test of English as a Foreign Language (TOEFL) are the most commonly required indications of English language proficiency, and are used to supplement other admission information, including other test scores (Educational Testing Service and the Graduate Management Admission Council, 1978).

As pointed out in the TOEFL Test and Score Manual (Educational Testing Service, 1978), interpreting the relationships between TOEFL scores and scores on other verbal aptitude and achievement tests can be complex. Because of foreign students' generally lower proficiency in English, when compared with native speakers, and the variety of cultural and international differences among foreign candidates, conventional interpretations of admission test scores can be misleading for foreign students. Furthermore, because the purpose of TOEFL is somewhat different from that of admissions tests that measure aptitude for academic study, its characteristics are different from those of other tests used in the admissions process. Whereas the TOEFL is an English language proficiency test that is designed for, and normed on, non-native speakers, the GMAT is a general aptitude or ability test containing both a verbal and a quantitative component and designed to predict future academic performance.

One consequence of norming the TOEFL and the GMAT on different populations, but scaling each of these tests to yield an average total score near 500, is that any given sample of examinees can generally be expected not only to answer a lower percentage of questions on the GMAT-Verbal section than on the TOEFL, but also to obtain a lower average

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[1]Personal communication with GMAT program staff, August 1980.

total score on the GMAT than on the TOEFL, each of which is expressed on a 200 to 800 scale. It is perhaps not surprising then that concern is sometimes expressed by admissions officers about the apparent discrepancies between GMAT scores and TOEFL scores.

The major objective of this study was to collect data that will facilitate interpretations of the relationships between the GMAT and the TOEFL scores of foreign applicants. Considered under this objective were the following questions:

1) What is the form of the relationship(s) between TOEFL and GMAT scores? Is this relationship the same for various combinations of TOEFL and GMAT subscores and for various major language groups?

2) Do the relationships between GMAT and TOEFL scores suggest a particular level of TOEFL scores at which GMAT scores become meaningful for foreign applicants?

3) How can apparent "discrepancies" between TOEFL and GMAT scores be explained? Do "discrepancies" vary according to native countries?

A second objective of the study was to investigate the accuracy with which foreign GMAT candidates report their TOEFL scores and to explore the implications of using candidates' self-reports in certain contexts.

Procedures

The Sample

The necessary first step in comparing TOEFL and GMAT scores was to obtain a sample of test candidates that had both GMAT and TOEFL scores. To this end, the file of candidates who had taken the GMAT between September 1977 and August 1979 was searched for students who indicated, when registering for the GMAT, both that they were not U. S. citizens and that the language in which they were most fluent was not English. Next, the GMAT candidates who were identified as foreign by these procedures were matched with records from the TOEFL test files for the 1977-1979 processing years using first name, middle initial, last name, sex, and birthdate as the matching criteria. For candidates who had more than one GMAT and/or TOEFL score for the two-year period, only the most recent score or scores were used. Only TOEFL candidates who participated in either an international or a special administration, not an institutional one, were included in the study.

Analyses

The primary analytic technique was least-squares regression. GMAT scores, both total and subscores, were regressed on TOEFL total and TOEFL subscores, allowing for both linear and curvilinear (quadratic) relationships. The analyses were computed for all students regardless of country of origin and for the several countries sending the largest numbers of candidates. Scatterplots were also generated for samples of candidates for each of the regression analyses, and tables were devised to show the GMAT scores predicted for various levels of the TOEFL.

Results

Sample Description

A total of 5,781 candidates who had both GMAT scores and TOEFL scores constituted the study sample. The numbers of students making up the sample from various countries, along with their average GMAT and TOEFL test scores, are shown in Table 1. The average TOEFL total score of the total matched sample was 551.9 (SD = 66.4), which compares with a mean score of 506 (SD = 74) for all graduate-level TOEFL examinees tested between 1976 and 1977 (Educational Testing Service, 1978). The average GMAT-V and GMAT-Q scores of 16.7 (SD = 8.4) and 28.4 (SD = 9.4), respectively, for this sample compares with the averages of 26 (SD = 9) and 27 (SD = 8) for all GMAT candidates tested between 1975 and 1978 (Educational Testing Service, 1978). Clearly, then the sample on which this study is based is generally somewhat more proficient in English than foreign graduate-level candidates in general and somewhat more able quantitatively than graduate management candidates in general. However, if GMAT-Verbal scores were a true reflection of the verbal ability of these candidates, these candidates would appear to be considerably less able verbally than graduate management candidates in general.

The large disparity between GMAT-V and GMAT-Q scores for this group, when compared with the corresponding small one-point average difference for all candidates, suggests that these candidates are considerably more able quantitatively than verbally, at least in English. However, it also suggests that the GMAT, an English verbal ability measure, does not necessarily reflect adequately the native language verbal ability of those candidates and/or that these candidates are highly self-selected on the basis of the discrepancy between verbal and quantitative ability. The first possibility seems more likely. The GMAT Total score mean of the sample is 394.5 (SD = 103.4) on the 200-800 scale, while the mean TOEFL Total score is 551.9 for the sample. It should be reiterated here that, although both TOEFL and GMAT report total scores on a 200-800 scale, the two tests are normed on different samples so as to yield average scores of approximately 500, and therefore should not be compared directly.

Table 1

Means and Standard Deviations of TOEFL and GMAT Scores for Candidates Taking Both Tests for Selected Countries

Country	N[a]		TOEFL Total	TOEFL Listening Comprehension	TOEFL Structure and Written Expression	TOEFL Reading Comprehension and Vocabulary	GMAT Total	GMAT Verbal	GMAT Quantitative
Belgium	56/50	Mean	581.4	59.1	56.1	59.2	443.2	20.2	32.0
		S.D.	47.1	5.4	6.4	3.8	104.2	8.5	8.4
Brazil	73/61	Mean	551.8	56.2	52.5	56.7	420.8	19.2	29.7
		S.D.	61.0	7.5	7.2	6.2	88.6	7.4	7.7
Canada	60/56	Mean	588.8	60.6	55.7	60.3	447.1	22.1	30.3
		S.D.	59.7	5.9	7.8	5.7	94.3	7.7	7.6
Columbia	64/57	Mean	545.9	55.7	52.4	55.6	379.8	16.7	25.8
		S.D.	58.3	7.2	7.1	5.6	93.2	7.8	7.5
France	215/179	Mean	579.8	57.7	56.3	60.0	459.5	22.1	32.5
		S.D.	44.7	5.7	5.5	4.1	95.5	6.9	9.5
Germany	54/45	Mean	590.4	60.5	57.0	59.6	445.6	22.0	30.0
		S.D.	39.5	4.3	5.2	3.8	89.8	8.0	7.8
Greece	78/57	Mean	538.2	55.4	52.5	53.2	369.4	15.1	26.0
		S.D.	66.0	6.8	7.6	8.0	86.1	7.1	9.0
Hong Kong	146/125	Mean	574.2	57.9	55.5	58.9	445.4	19.7	33.4
		S.D.	43.1	5.9	5.6	4.3	87.9	6.8	9.1
India	1088/992	Mean	583.8	56.8	58.4	59.9	433.3	20.5	29.9
		S.D.	64.0	7.5	7.3	6.2	118.4	9.2	10.2
Iran	350/309	Mean	492.4	52.0	48.3	47.3	319.2	11.2	22.6
		S.D.	68.4	8.1	7.8	7.9	89.1	7.5	7.7

(Cont'd.)

Table 1 (Cont'd.)

Country	N[a]		TOEFL Total	TOEFL Listening Comprehension	TOEFL Structure and Written Expression	TOEFL Reading Comprehension and Vocabulary	GMAT Total	GMAT Verbal	GMAT Quantitative
Israel	124/113	Mean	559.3	59.8	53.8	53.4	410.1	16.9	32.0
		S.D.	59.5	5.4	7.0	8.3	76.2	7.0	6.0
Italy	68/54	Mean	579.9	56.7	57.0	60.3	445.9	22.7	29.3
		S.D.	48.7	6.2	6.2	3.9	82.3	6.8	7.6
Japan	785/612	Mean	530.8	52.6	52.6	54.0	396.3	14.2	32.4
		S.D.	55.0	6.1	6.6	6.2	88.7	6.7	8.4
Korea	199/157	Mean	546.9	52.1	54.6	57.3	433.3	16.8	35.1
		S.D.	52.2	6.2	6.4	5.8	91.2	6.8	9.0
Lebanon	50/42	Mean	575.6	59.3	56.6	56.9	410.4	18.2	29.0
		S.D.	49.1	5.2	5.6	5.8	107.2	8.4	8.6
Malaysia	84/76	Mean	599.0	60.5	58.3	60.9	405.4	19.6	26.2
		S.D.	45.4	5.3	5.8	4.5	86.7	7.0	8.7
Mexico	163/142	Mean	549.8	56.9	51.8	56.3	381.0	16.8	26.0
		S.D.	62.7	6.6	7.7	6.2	95.1	7.4	8.4
Netherlands	53/45	Mean	610.4	63.0	59.1	61.1	474.7	24.1	32.4
		S.D.	31.0	2.8	4.5	3.4	88.3	7.5	7.6
Nigeria	117/96	Mean	581.3	55.3	59.4	59.7	343.4	16.7	19.2
		S.D.	39.0	5.8	4.6	4.4	76.7	6.8	5.9
Norway	82/74	Mean	587.7	61.4	57.1	57.9	403.1	18.1	28.0
		S.D.	41.6	3.9	5.8	4.7	87.6	7.3	7.4
Pakistan	131/114	Mean	564.8	56.1	55.8	57.7	364.3	16.6	23.0
		S.D.	67.2	7.1	8.3	6.9	101.7	8.3	8.2

(Cont'd.)

Table 1 (Cont'd.)

Country	N[a]		TOEFL Total	TOEFL Listening Comprehension	TOEFL Structure and Written Expression	TOEFL Reading Comprehension and Vocabulary	GMAT Total	GMAT Verbal	GMAT Quantitative
Philippians	167/151	Mean	620.5	62.4	60.9	62.9	424.7	23.4	24.2
		S.D.	35.7	4.2	4.8	3.5	100.9	8.2	7.9
Taiwan	510/451	Mean	534.9	53.6	52.6	54.4	417.1	15.2	34.4
		S.D.	44.9	5.6	5.6	5.1	79.4	5.7	8.2
Thailand	591/524	Mean	493.9	50.9	48.4	49.0	322.9	9.7	25.6
		S.D.	52.3	6.2	6.4	6.0	71.3	5.1	7.7
Turkey	150/138	Mean	531.8	54.7	51.9	53.0	361.6	14.7	25.4
		S.D.	70.1	7.4	7.6	8.0	92.3	7.5	8.1
Venezuela	110/94	Mean	516.2	53.4	48.3	53.2	336.9	14.3	21.4
		S.D.	63.9	7.0	7.6	6.5	89.2	7.0	8.1
Other Countries	310/265	Mean	527.6	53.7	51.6	53.1	358.0	14.1	25.6
		S.D.	70.6	7.1	8.1	8.3	96.9	8.1	8.5
All Countries	6678/5793	Mean	550.2				394.4	16.7	28.4
		S.D.	66.5				103.4	8.4	9.4

[a]Number on left lindicates those for whom TOEFL scores were available; number on right indicates those for whom GMAT scores were available. All analyses are based on the number for whom both TOEFL and GMAT scores were available.

Regression Analyses Relating GMAT and TOEFL Scores

Table 2 gives the simple correlations between GMAT scores and

Table 2

Simple Correlations Between GMAT and TOEFL Scores

	TOEFL Score			
GMAT Score	Listening Comprehension	Structure and Written Expression	Reading Comprehension and Vocabulary	Total
GMAT-Verbal	.58	.66	.69	.39
GMAT-Quantitative	.29	.37	.3[illegible]	.39
GMAT-Total	.52	.61	.64	.66

TOEFL scores for all 5,781 candidates. As expected, the correlations between TOEFL scores and GMAT-Verbal scores (.58 to .69) are considerably higher than those between TOEFL scores and GMAT-Quantitative scores (.29 to .39). The TOEFL Listening Comprehension section scores show a lower relationship with GMAT-V than either of the other two TOEFL subscores do. This finding is not unexpected since the GMAT does not attempt to measure listening comprehension. The overall patterns of correlations of TOEFL scores with GMAT-V and with GMAT-Q provide support to the discriminant validity of TOEFL as a measure of verbal skills in contrast to quantitative skills. Quite simply, as expected, proficiency in English, as measured by the TOEFL, correlates more highly with aptitude in the verbal domain than aptitude in the quantitative domain.

Table 3 contains the raw regression weights when each GMAT score is predicted in turn from each TOEFL score when a quadratic term is permitted in the equation, i.e., when curvilinearity is permitted. As an example of how to read this table, GMAT Total can be predicted from TOEFL Total by using the following equation: GMAT Total = 567.3 - 1.77 (TOEFL-Total) + .0026 (TOEFL Total^2). A comparison of the multiple correlation

Table 3

Raw Regression Weights for GMAT Scores on TOEFL Scores
Using Linear and Quadratic Terms for TOEFL Scores

Dependent Variable		Independent Variables: Listening Comprehension	Structure and Written Expression	Reading Comprehension and Vocabulary	TOEFL Total
GMAT-V	Constant	48.94	33.97	60.40	68.79
	Linear	-1.9653	-1.4664	-2.5724	-0.2960
	Quadratic	0.0245	0.0207	0.0315	0.0004
	Multiple R	.60	.68	.74	.75
GMAT-Q	Constant	1.05	-10.52	9.65	-15.78
	Linear	0.6215	1.0176	(0.1533)	0.1075
	Quadratic	(-0.0023)	-0.0054	0.0032	-0.0000
	Multiple R	.29	.37	.39	.39
GMAT-Total	Constant	499.03	320.01	642.23	567.32
	Linear	-12.1888	-6.1728	-19.7513	-1.7710
	Quadratic	0.1827	0.1365	0.2694	0.0026
	Multiple R	.53	.62	.66	.67

Note. Regression weights that are not significant ($p > .05$)

coefficients given in Table 3 with the simple correlation given in Table 2 shows that, for the correlations between GMAT-V and each TOEFL subscore, allowing a curvilinear fit increases the correlation by .02 for listening comprehension and for structure/written expression, by .05 for the reading comprehension/vocabulary subtest, and by .04 for TOEFL Total, all of which are statistically significant. However, none of the correlations of GMAT-Q with any TOEFL score, either subtest or total, increases when curvilinearity is permitted. As would be expected, the corresponding increases for GMAT Total, which is a function of both verbal and quantitative scores, are approximately midway between those for GMAT-V and GMAT-Q. We note also that the form of the relationship, as indicated by negative weights for the linear term and positive weights for the quadratic term, is the same for each prediction of GMAT-V regardless of which TOEFL score is used. On the other hand, because the quadratic weights are negligible, each of the linear weights is positive for predictions of GMAT-Q. Figures in Appendices A, B, and C show the linear and the curvilinear[2] relationships for various combinations of GMAT and TOEFL scores. Although only a sample of data points has been plotted, the lines of fit are based on all 5,781 cases.

Table 4 shows gives predicted GMAT scores, using both linear and quadratic fits, for various levels of TOEFL Total and TOEFL subtest scores. Because the relationship between GMAT-Q and each TOEFL score is essentially linear, the linear and quadratic predictions are nearly identical at each TOEFL score level. For GMAT-V, however, and to a lesser extent for GMAT Total as well, the linear and quadratic predictions differ somewhat, reflecting the better curvilinear fit. The linear fit generally yields somewhat lower predictions than the quadratic fit for very low and very high TOEFL levels, but higher predictions for more moderate values of TOEFL. It should be noted that the GMAT score predictions are average or expected values. For example, Table 4 shows that for foreign GMAT candidates whose TOEFL Total score is 500, the expected GMAT-Verbal score is 12.0 or 10.8, depending on whether a linear or quadratic fit is used. With a standard error of estimate of 5.9 points (linear) or 5.5 points (quadratic) we should expect approximately two-thirds of GMAT foreign candidates with TOEFL Total scores of 500 to obtain GMAT-V scores between 6 to 18 (linear) or between 5 and 16.

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[2] It will be readily apparent to the reader that some of the curves shown in the appendices have negative slopes in the lower score ranges, suggesting an inverse relationship between GMAT and TOEFL scores for low scores. In fact, however, these negative slopes are merely a statistical artifact of the quadratic fit. More appropriate fits could be made to show these curves asymtotically approaching lines parallel to the horizontal axis.

Table 4

Correspondence Between TOEFL Scores and Predicted GMAT Scores at Various Levels of TOEFL Scores

Predictor Variable	Score Level	Predicted GMAT Scores for GMAT-V Linear Fit	GMAT-V Quadratic Fit	GMAT-Q Linear Fit	GMAT-Q Quadratic Fit	GMAT-Total Linear Fit	GMAT-Total Quadratic Fit
TOEFL Total	450	7.5	8.5	22.8	22.7	290.4	296.9
	500	12.0	10.8	25.5	25.7	341.5	331.8
	550	16.5	14.9	28.3	28.5	392.5	379.8
	600	21.0	20.8	31.0	31.1	443.6	440.7
	650	25.5	28.5	33.8	33.4	494.7	514.7
Listening Comprehension	45	9.6	10.1	24.5	24.4	315.9	320.5
	50	12.9	11.9	26.3	26.4	353.3	346.3
	55	16.3	15.0	28.2	28.3	390.8	381.3
	60	19.7	19.2	30.1	30.1	428.2	425.4
	65	23.1	24.7	32.0	31.7	465.6	478.7
Structure and Written Expression	45	10.1	9.9	24.3	24.3	319.3	318.6
	50	13.7	12.4	26.5	26.9	360.2	352.6
	55	17.2	15.9	28.8	29.1	401.1	393.4
	60	20.8	20.5	31.0	31.1	442.0	441.0
	65	24.4	26.1	33.3	32.8	482.9	495.5
Reading Comprehension and Vocabulary	45	8.2	8.4	23.0	23.1	297.7	299.0
	50	12.1	10.5	25.5	25.4	342.2	328.2
	55	16.0	14.2	28.0	27.9	386.7	370.8
	60	19.9	19.5	30.5	30.5	431.3	427.0
	65	23.7	26.3	32.9	33.3	475.8	496.6

Similar ranges could be computed for other TOEFL Total score levels and for TOEFL subtests. If less stringent criteria (e.g., two standard errors of estimate) were applied in determining discrepant GMAT scores, even wider ranges of GMAT scores would not be considered discrepant.

Tables 5, 6, 7, and 8 show the regression weights, using a quadratic fit, to predict GMAT Total and GMAT-V scores from TOEFL Total and TOEFL subscores for each of the five countries (India, Iran, Japan, Taiwan, and Thailand) having the largest number of GMAT candidates. These relationships are plotted in the Figures in Appendices D and E. As can be seen, the relationships are curvilinear with the slope of the curve increasing for higher TOEFL scores for the regression of each TOEFL score on GMAT-V for each country. For regressions on GMAT Total score, the Japanese group is the only group that does not exhibit the same curvilinear relationship, suggesting perhaps that the quantitative component of the GMAT Total score for this group may have more influence than the verbal component.

In general, the relationship between GMAT-V and TOEFL scores is fairly similar across different major groups. However, the correlations of TOEFL and GMAT scores are consistently lower for Iranian students than for any other group. These lower correlations reflect the fact that Iranian candidates score lower on both the TOEFL and the GMAT than any other candidate group. Because GMAT scores would show even less differentiation among these low scoring candidates, the correlations between GMAT and TOEFL scores would also be expected to be lower, reflecting the flatter, left-most portion of the curve.

As another indication of the consistency of the relationship between GMAT scores and TOEFL scores across countries, the correlations among GMAT mean scores and TOEFL mean scores were computed for all 137 countries for which data were available, even though some countries had very small numbers of candidates. The reader should note that these correlations between average country scores contrast with the correlations reported earlier between scores for individual candidates. Even though only a linear regression was used, the correlations were very high, as is expected for correlations among means. The correlation between each TOEFL score mean and each GMAT score mean was .91 or higher for each subtest, indicating that, on the average, a country's rank in terms of the average test scores of its candidates can be expected to be nearly the same regardless of whether GMAT or TOEFL test scores are considered. (These correlations would have been even higher if countries with small numbers of candidates had been excluded from the calculations.) In summary, the <u>average</u> GMAT score(s) of all candidates coming from particular countries can be predicted with a high degree of accuracy from average TOEFL scores, although the same degree of accuracy does not hold true for individual candidates. Nonetheless, the relative "discrepancy" between TOEFL and GMAT scores remains comparable from country to country.

Table 5

Regressions of GMAT Scores on TOEFL Total Score for Selected Countries

Dependent Variable	Country	N	Raw Regression Weights			Standard Error of Estimate	Multiple R
			Constant	Linear	Quadratic		
GMAT-Total	India	992	754.5	-2.6940	0.0036	80.7	.73
	Iran	303	1173.3	-3.9338	0.0044	80.7	.42
	Japan	612	122.4	-0.0875	0.0011	65.2	.68
	Taiwan	450	192.0	-0.1918	0.0011	65.4	.57
	Thailand	524	272.3	-0.7092	0.0015	56.3	.62
	All Candidates	5,781	567.3	-1.7710	0.0026	76.7	.67
GMAT-V	India	992	62.0	-0.2757	0.0003	5.8	.78
	Iran	303	92.2	-0.3667	0.0004	6.8	.43
	Japan	612	34.7	-0.1663	0.0002	4.9	.69
	Taiwan	450	21.8	-0.1032	0.0002	4.6	.60
	Thailand	524	34.3	-0.1555	0.0002	4.2	.58
	All Candidates	5,781	68.8	-0.2960	0.0004	5.5	.75

Table 6

Regressions of GMAT Scores on TOEFL Listening Comprehension Score for Selected Countries

Dependent Variable	Country	N	Raw Regression Weights			Standard Error of Estimate	Multiple R
			Constant	Linear	Quadratic		
GMAT Total	India	992	431.2	-10.5453	0.1830	94.9	.60
	Iran	303	732.5	-20.3989	0.2341	83.3	.35
	Japan	612	-60.2	10.0361	(-0.0260)	76.7	.51
	Taiwan	450	486.2	-7.4908	0.1143	75.1	.33
	Thailand	524	287.1	-4.1222	0.0935	62.9	.47
	All Candidates	5,781	499.0	-12.1888	0.1827	87.8	.53
GMAT-V	India	992	25.4	-1.0683	0.0170	7.0	.64
	Iran	303	48.6	-1.7891	0.0201	7.1	.33
	Japan	612	14.5	-0.5968	0.0110	5.8	.52
	Taiwan	450	21.5	-0.6623	0.0101	5.3	.40
	Thailand	524	20.0	-0.7802	0.0112	4.6	.45
	All Candidates	5,781	48.9	-1.9653	0.0245	6.7	.60

Note: Regression weights in parentheses are not significant (p>.05).

Table 7

Regressions of GMAT Scores on TOEFL Structure and Written Expression Score for Selected Countries

Dependent Variable	Country	N	Raw Regression Weights			Standard Error of Estimate	Multiple R
			Constant	Linear	Quadratic		
GMAT Total	India	992	398.1	-11.5362	0.2046	86.9	.68
	Iran	303	712.6	-19.5816	0.2311	84.3	.32
	Japan	612	-63.1	9.855	(-0.0091)	70.1	.61
	Taiwan	450	270.0	-2.3135	0.0957	67.2	.54
	Thailand	524	262.7	-3.6926	0.1007	59.8	.55
	All Candidates	5,781	320.0	-6.1728	0.1365	81.5	.62
GMAT-V	India	992	23.4	-1.1677	0.0188	6.4	.72
	Iran	303	55.2	-2.0999	0.0240	7.0	.35
	Japan	612	2.7	-0.2061	0.0079	5.4	.59
	Taiwan	450	1.0	-0.0113	0.0052	4.9	.52
	Thailand	524	20.4	-0.8509	0.0128	4.4	.51
	All Candidates	5,781	34.0	-1.4664	0.0207	6.1	.68

Table 8

Regressions of GMAT Scores on TOEFL Reading Comprehension and Vocabulary Scores for Selected Countries

Dependent Variable	Country	N	Raw Regression Weights			Standard Error of Estimate	Multiple R
			Constant	Linear	Quadratic		
GMAT Total	India	992	1040.2	-37.9370	0.4588	79.1	.74
	Iran	303	688.8	-19.6338	0.2432	82.6	.37
	Japan	612	327.5	-7.6636	0.1632	65.8	.67
	Taiwan	450	405.5	-9.0423	0.1682	65.6	.57
	Thailand	524	426.2	-11.2932	0.1846	57.7	.59
	All Candidates	5,781	642.2	-19.7513	0.2694	77.3	.66
GMAT-V	India	992	85.2	-3.6159	0.0418	5.8	.77
	Iran	303	46.5	-1.8252	0.0222	7.0	.37
	Japan	612	37.0	-1.6638	0.0227	4.9	.68
	Taiwan	450	45.5	-1.8334	0.0232	4.7	.58
	Thailand	524	36.4	-1.5764	0.0207	4.2	.57
	All Candidates	5,781	60.4	-2.5724	0.0315	5.7	.74

A question of interest to admissions staff is "At what point on the TOEFL score scale does verbal aptitude, as measured by GMAT-V, become predictable from proficiency in English, as measured by TOEFL Total score?" That is, at what point does the GMAT-Verbal score seem to discriminate among candidates' levels of verbal ability, or what is the minimum TOEFL score necessary before one can begin to demonstrate his/her verbal ability? From Figures B.2 and E.2 it appears that a TOEFL Total score of approximately 450 is needed before the GMAT-Verbal score can begin to be considered as a discriminating indicator of a candidate's verbal ability. By comparison, GMAT-Q scores, which exhibit a consistent linear relationship with TOEFL scores, would seem to be a more appropriate measure for foreign candidates at lower TOEFL levels, according to our criterion of linearity. Logically, however, it would seem that a candidate's ability to demonstrate his/her quantitative aptitude would also be impaired by extremely low English proficiency, since test directions are given in English.

Relationship Between Self-reported and Actual TOEFL Scores

The second objective of the study was to assess the accuracy with which foreign GMAT candidates report their own TOEFL scores. Table 9 contains the regression weights, both linear and quadratic fits, for predicting actual TOEFL-Total score from self-reported TOEFL-Total score. As shown, the correlation is high (.91 or .92 depending on the fit used) and the standard errors of estimate are relatively low (25.1 and 24.1), indicating that those candidates who report their own TOEFL scores do so with considerable accuracy. (The quadratic results are reported here only for the sake of completeness. Although the quadratic fit is significantly better statistically, it is not much better from a practical standpoint.) The correspondence between various levels of TOEFL self-reported scores and predicted actual scores is shown in Table 10, which suggests that the discrepancies are small, particularly at the upper TOEFL score levels. These data suggest that those who report low TOEFL scores (450 or lower) probably received, on the average, actual scores that were somewhat higher. Figures 1 and 2 show the relationships between actual and self-reported TOEFL Total scores when linear and quadratic fits are used. As indicated by the substantial number of points falling on the line of fit, many candidates report their scores exactly. When compared with high scoring candidates, lower scoring candidates report their scores with somewhat less accuracy, reporting either higher or lower scores than they actually received.

Only about 36 percent of the candidates taking both the GMAT and TOEFL tests in our sample of 5,781 reported their TOEFL scores. For most students this failure to report TOEFL scores may merely reflect the fact that they took the GMAT before they took the TOEFL. For some, however, this failure may reflect a reluctance to report low scores or a failure to remember them.

Table 9

Raw Regression Weights for TOEFL Total Scores on TOEFL Self-reported Scores

Regression Weight for	TOEFL Total Predicted from: TOEFL Total Self-reported (Linear Fit)	TOEFL Total Predicted from: TOEFL Total Self-reported (Quadratic Fit)
Constant	55.14	385.21
TOEFL Total Self-reported (Linear)	0.9020	-0.3513
TOEFL Total Self-reported (Quadratic)	---	0.0012
Standard Error of Estimate	25.05	24.19

Note. All analyses are based on 2,067 candidates who self-reported a TOEFL score.

Table 10

Correspondence Between Self-reported TOEFL Scores
and Predicted Actual TOEFL Scores

Self-reported TOEFL Score	Actual TOEFL Score Predicted from Self-reported TOEFL	
	Linear	Quadratic
400	415.9	436.7
450	461.0	470.1
500	506.1	509.6
550	551.2	555.0
600	596.3	606.4
650	641.4	663.9

Figure 1

Regression of TOEFL Total Score on Self-reported TOEFL Total Score (Linear)

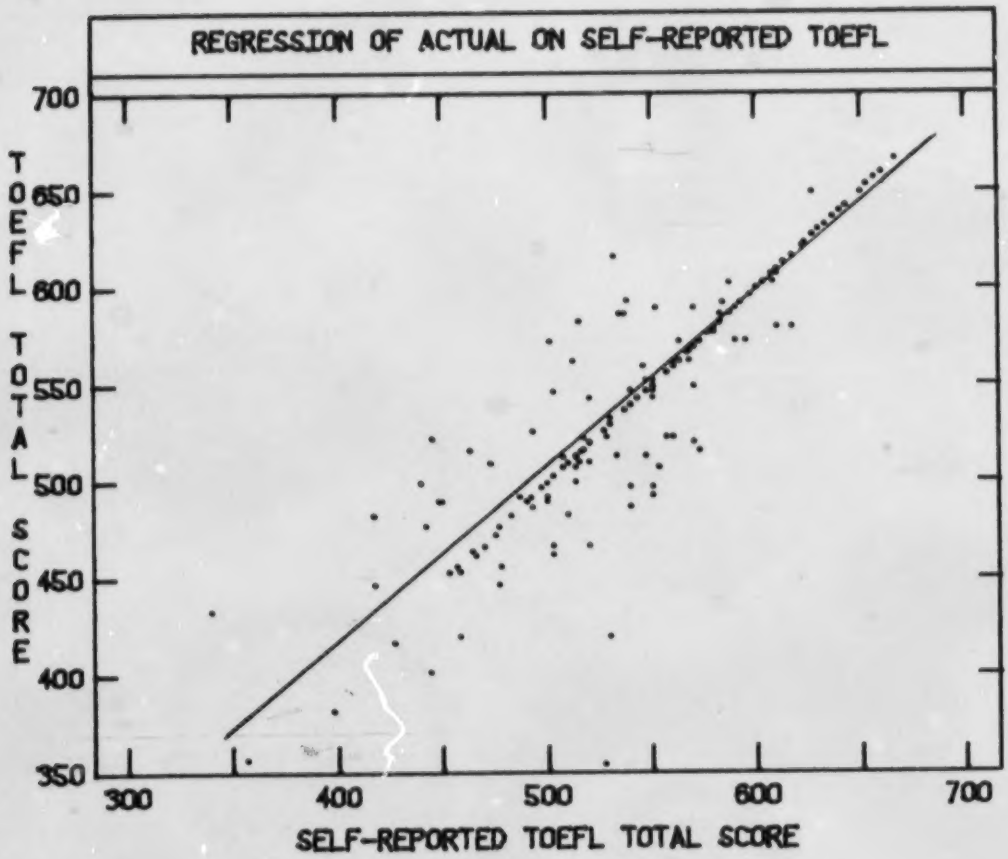


Figure 2

Regression of TOEFL Total Score on Self-reported TOEFL Total Score (Quadratic)

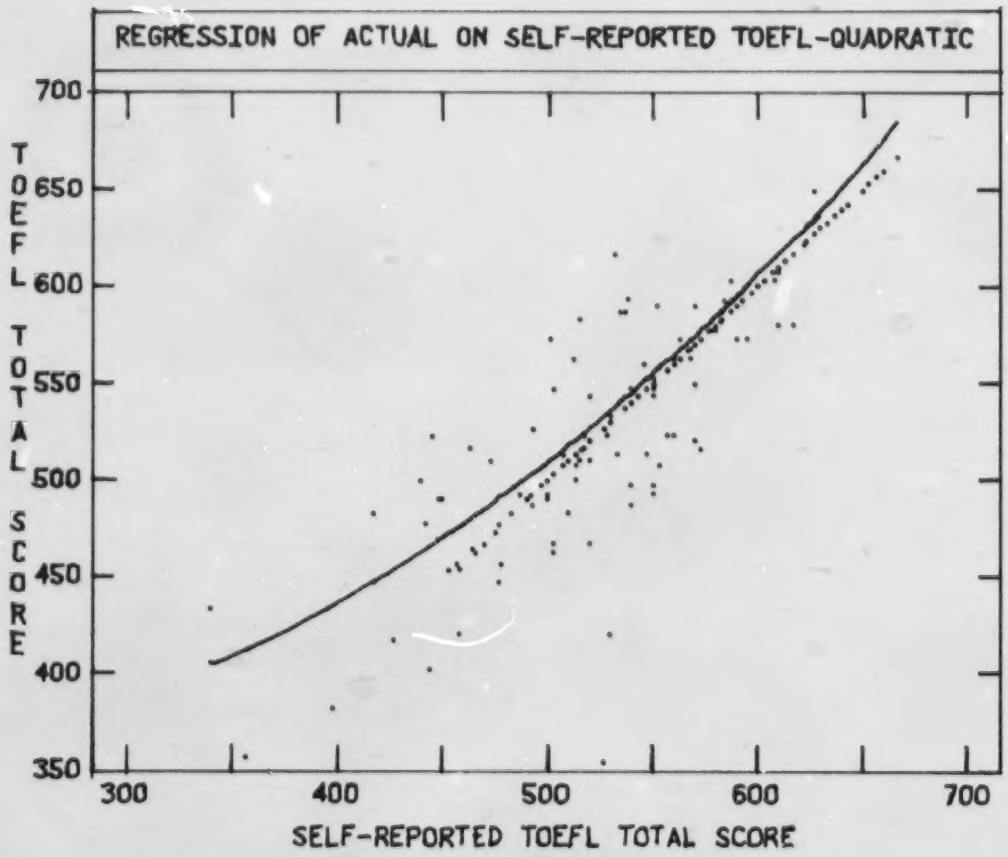


Table 11 shows that the TOEFL and GMAT scores of GMAT candidates who report their TOEFL scores are quite comparable to the scores of those who do not report TOEFL scores, suggesting that there is very little bias reflected in the failure to report scores. The average TOEFL Total scores of these two groups are virtually identical, and the average GMAT scores are nearly so.

The high correlations between TOEFL actual and TOEFL self-reported scores, and the apparent lack of bias in their reporting--in terms of either over- or underreporting, or failing to report scores--suggests that self-reported TOEFL scores may have usefulness for certain purposes. Although the correlation between self-reported and actual TOEFL scores is very high, extreme caution should be exercised if self-reports are used to make decisions about individual candidates because of the ever-present potential for misrepresenting scores. However, the variable of self-reported TOEFL score may be extremely useful as a proxy for actual TOEFL scores in correlational studies in which the focus is groups of students, not individuals.

Table 12, shows that actual and self-reported TOEFL scores show very comparable patterns of correlations with selected other variables. Thus it would seem that studies of the correlates of TOEFL scores could be conducted by using the more readily obtained self-reports of these scores, thus effecting a savings in effort with very little loss in information.

Table 11

Comparison of Test Scores for Foreign GMAT Candidates Who Self-report TOEFL Scores with Candidates Who Do Not

Test Score		Group: Candidates Who Self-report a TOEFL Score (N=2,067)	Group: Candidates Who Do Not Self-report a TOEFL Score (N=3,714)
TOEFL Total (Actual)	Mean	551.9	551.9
	S.D.	60.5	61.9
TOEFL Total (Reported)	Mean	550.8	--
	S.D.	61.0	--
GMAT Total	Mean	391.5	395.9
	S.D.	99.1	102.1
GMAT-V	Mean	16.3	16.8
	S.D.	8.0	8.3
GMAT-Q	Mean	28.4	28.4
	S.D.	9.2	9.3

Table 12

Correlations of Self-reported and
Actual TOEFL Scores with Selected Variables

Variable	Correlation with TOEFL Total (Actual) (N=5,781)	Correlation with TOEFL Total (Self-reported) (N=2,067)
GMAT Total	.66	.63
GMAT-V	.71	.69
GMAT-Q	.39	.39
UGPA (Self-reported)	.20	.21

Summary and Discussion

A sample of nearly 6,000 noncitizen, nonfluent GMAT candidates, who had also taken the TOEFL, was drawn from GMAT and TOEFL test files for a recent processing period. Regression analyses were conducted and scatterplots were generated in order to examine: (1) the relationships between GMAT and TOEFL scores and (2) the relationship between actual TOEFL scores and candidates' self-reported scores.

As was expected, a consistent nonlinear relationship between TOEFL scores, both total score and subscores, and GMAT verbal scores was noted for the total sample of students and for samples coming from selected countries having large numbers of GMAT candidates. The form of the relationship suggests that, because of the level of difficulty of the test, GMAT verbal scores do not differentiate among low scoring TOEFL candidates. The relationships suggest that a minimum TOEFL Total score of approximately 450 is required before GMAT verbal scores begin to discriminate among candidates with respect to verbal ability as measured by the GMAT. Similarly, scores of about 45 appear to be the minimum TOEFL subtest scores at which GMAT verbal scores begin to achieve some degree of discrimination among foreign GMAT candidates. These patterns are consistent with the hypothesis that a minimal level of English language proficiency is needed before verbal aptitude in English can be accurately demonstrated. These findings are generally consistent with those obtained by Angelis, Swinton, and Cowell (1979) in a study of the relationships between TOEFL and GRE and SAT-Verbal scores.

On the other hand, the linear relationship between GMAT-Q scores and TOEFL scores suggests that the quantitative section of the GMAT is is more likely to differentiate among candidates with respect to quantitative ability, even at low levels of English proficiency. Examining these relationships (for both GMAT-V and GMAT-Q) for the several countries having the largest numbers of candidates (India, Iran, Japan, Taiwan, and Thailand) revealed that these relationships were fairly comparable across countries.

Tables showing the average expected GMAT-Verbal score for various levels of TOEFL Total scores show that, on the average, low GMAT-V scores can be anticipated to occur even for above average TOEFL scores. This expected empirical result serves to underscore the point that the purposes of the TOEFL and the GMAT verbal section are different: what may appear to be discrepancies between TOEFL and GMAT scores are clearly to be expected.

With respect to the relationship between TOEFL actual and TOEFL self-reported scores, although a relatively small number of candidates either understate or overstate their TOEFL scores by a significant

degree, in general foreign GMAT candidates report their TOEFL scores with considerable accuracy. Considering the everpresent potential for misreporting scores, however, caution should be exercised in the use of self-reported scores for making decisions about individual candidates. On the other hand, the considerable accuracy and the lack of any systematic bias in reporting scores suggests that self-reported TOEFL scores can be confidently used to make inferences about the English language proficiency levels of groups of candidates, as well as to study the correlates of actual TOEFL scores.

References

Angelis, P. J., Swinton, S. C., & Cowell, W. R. The performance of non-native speakers of English on TOEFL and Verbal Aptitude tests (TOEFL Research Report Number 3). Princeton, N.J.: Educational Testing Service, 1979.

Educational Testing Service and the Graduate Management Admission Council. 1978-79 Graduate study in management: A guide for prospective students. Princeton, N.J.: Author, 1978.

Educational Testing Service. TOEFL test and score manual. Princeton N.J.: Author, 1978.

Appendix A

Plots of Linear and Quadratic Regressions of
GMAT Total Scores on TOEFL Scores for All Candidates

Figure A-1

Regression of GMAT Total Score on TOEFL Total Score
(Linear)

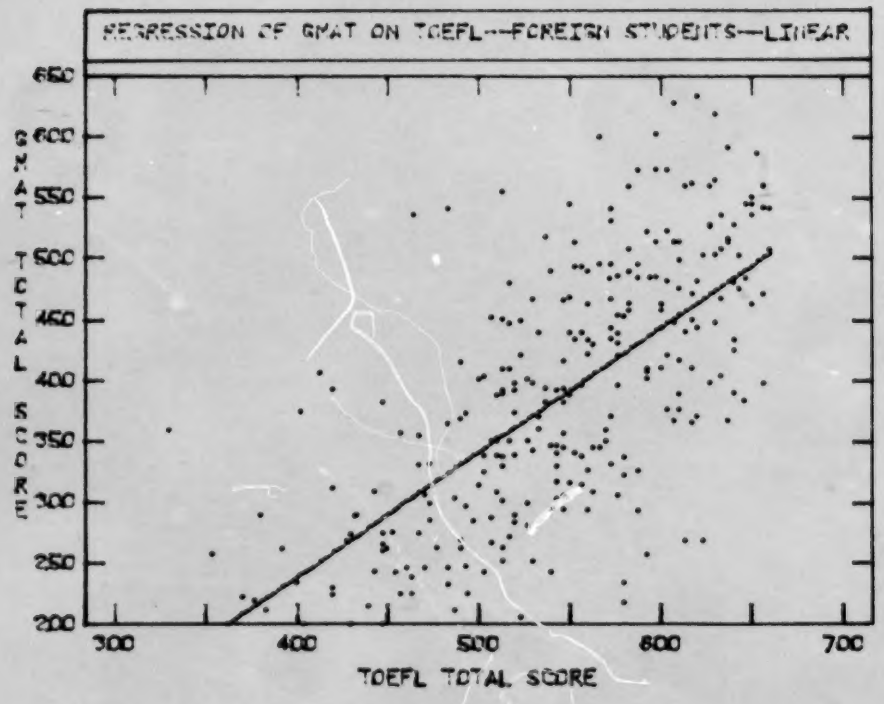


Figure A-2

Regression of GMAT Total Score on TOEFL Total Score
(Quadratic)

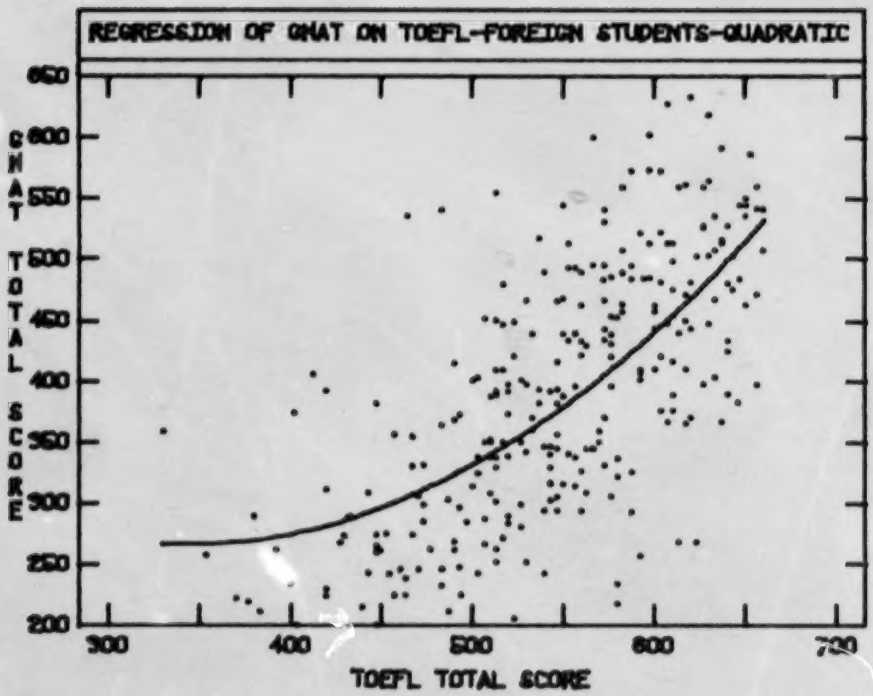


Figure A-3

Regression of GMAT Total Score on TOEFL
Listening Comprehension Score (Linear)

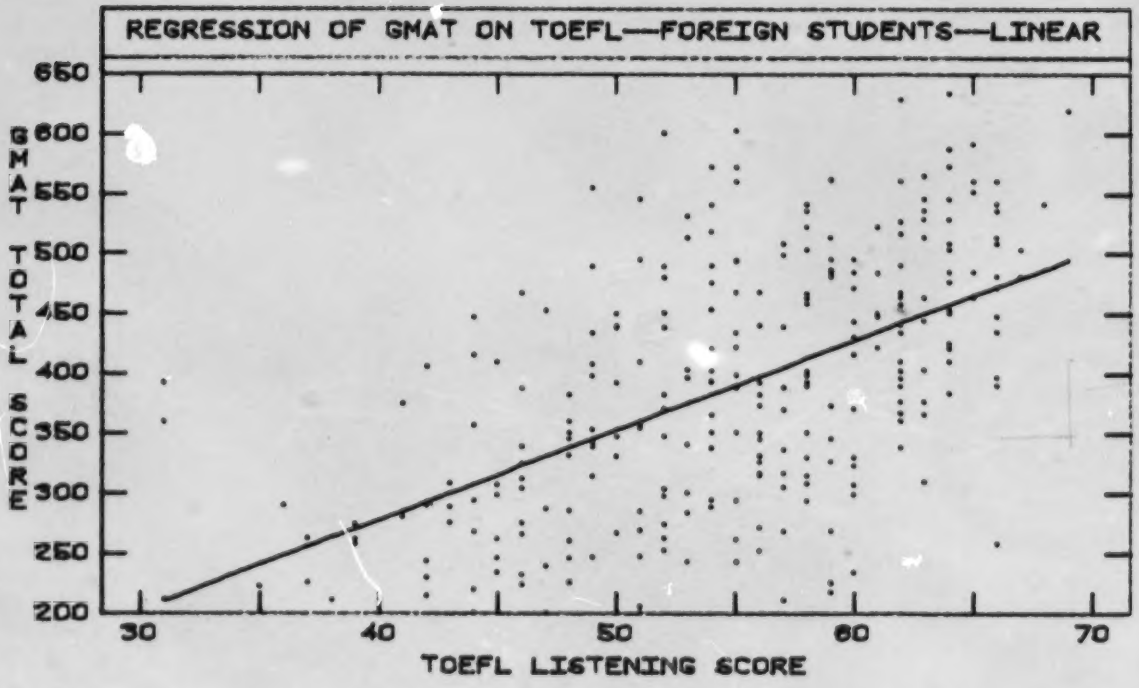


Figure A-4

Regression of GMAT Total Score on TOEFL
Listening Comprehension Score (Quadratic)

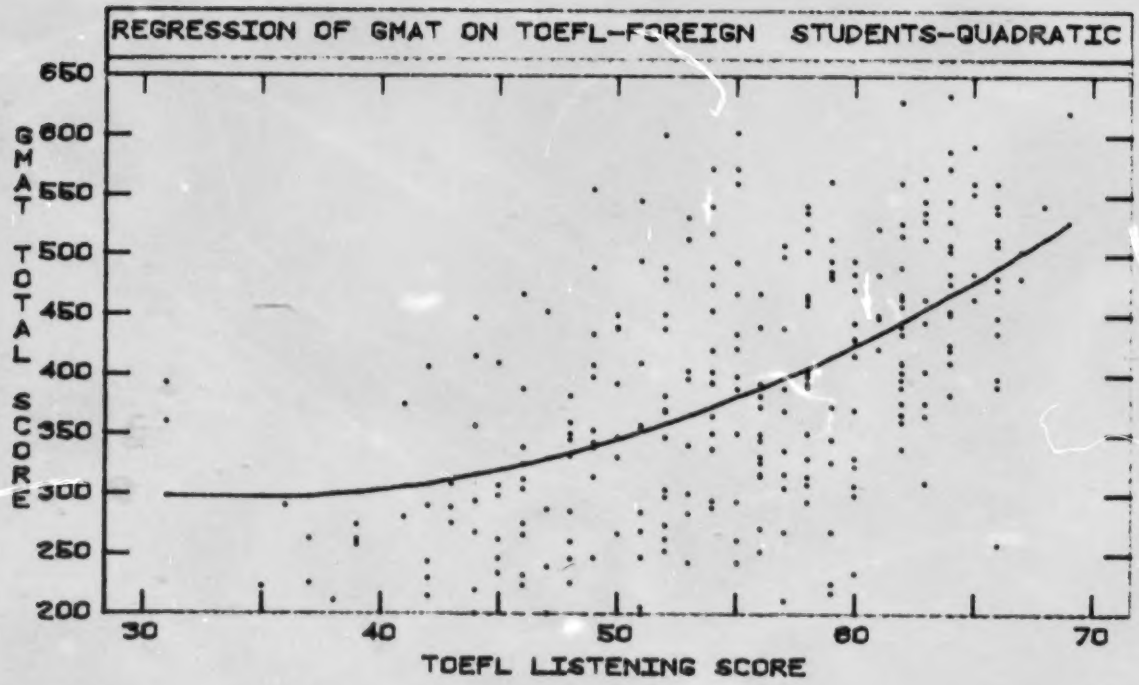


Figure A-5

Regression of GMAT Total Score on TOEFL Structure and Written Expression Score (Linear)

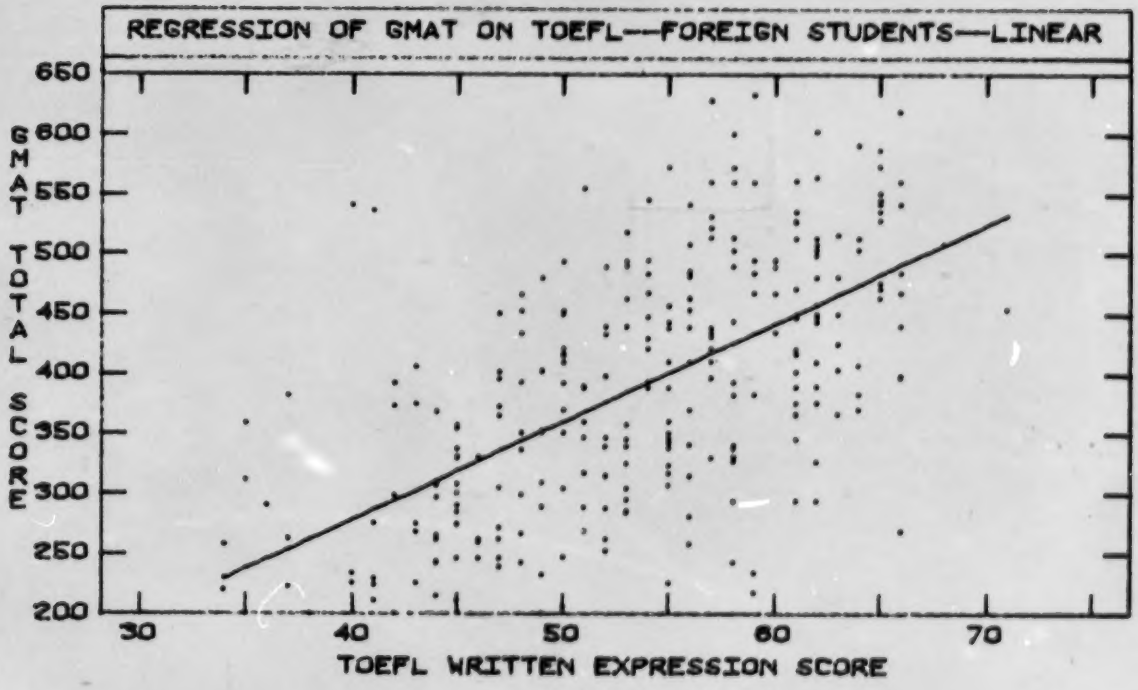


Figure A-6

Regression of GMAT Total Score on TOEFL Structure and Written Expression Score (Quadratic)

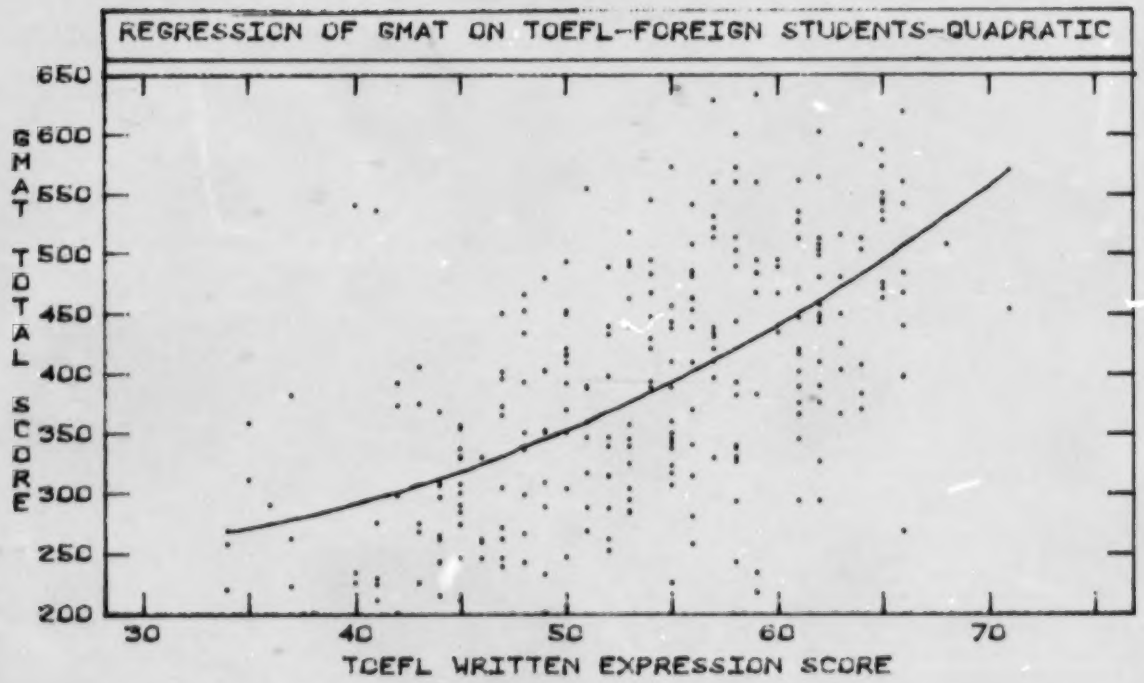


Figure A-7

Regression of GMAT Total Score on TOEFL
Reading Comprehension Score (Linear)

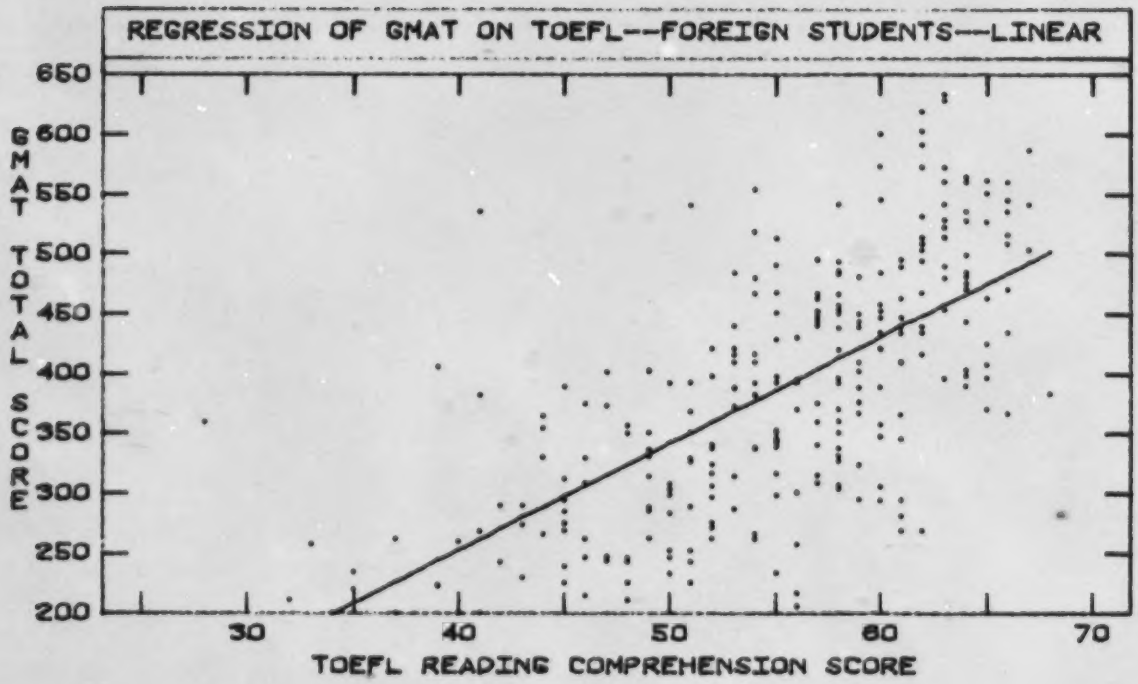
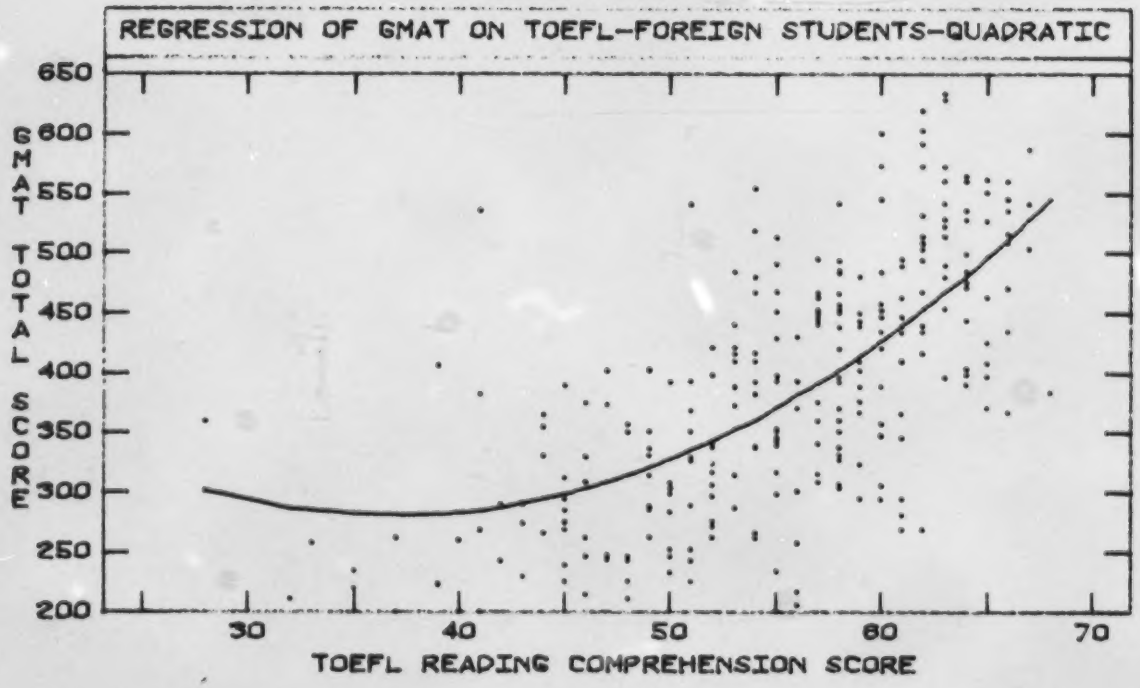


Figure A-8

Regression of GMAT Total Score on TOEFL Reading Comprehension Score (Quadratic)



Appendix B

Plots of Linear and Quadratic Regressions of GMAT-Verbal Scores on TOEFL Scores for All Candidates

Figure B-1

Regression of GMAT Verbal Score on TOEFL Total Score
(Linear)

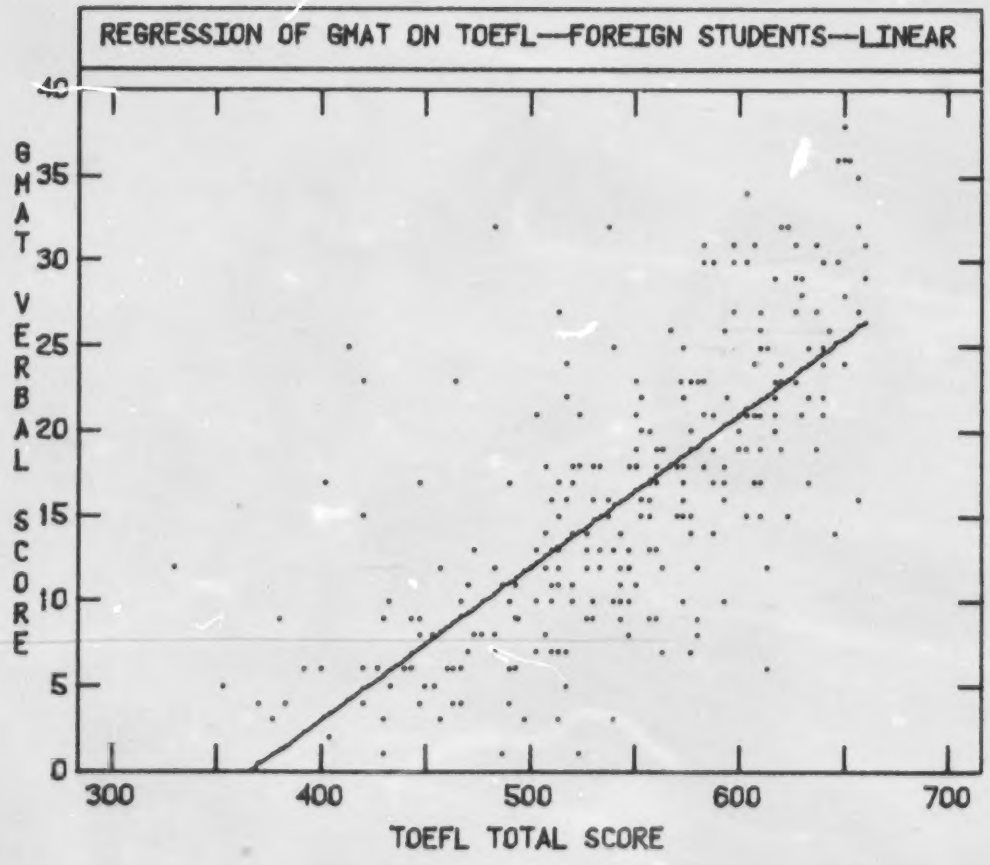


Figure B-2

Regression of GMAT Verbal Score on TOEFL Total Score
(Quadratic)

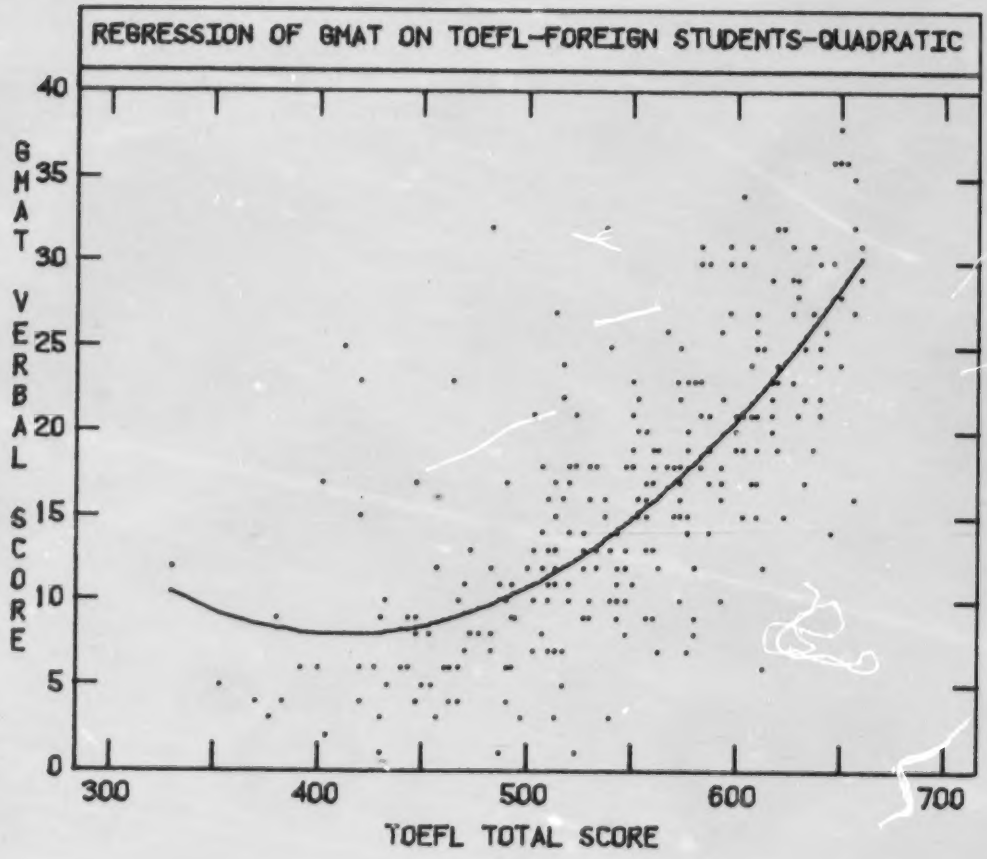


Figure B-3

Regression of GMAT Verbal Score on TOEFL
Listening Comprehension Score (Linear)

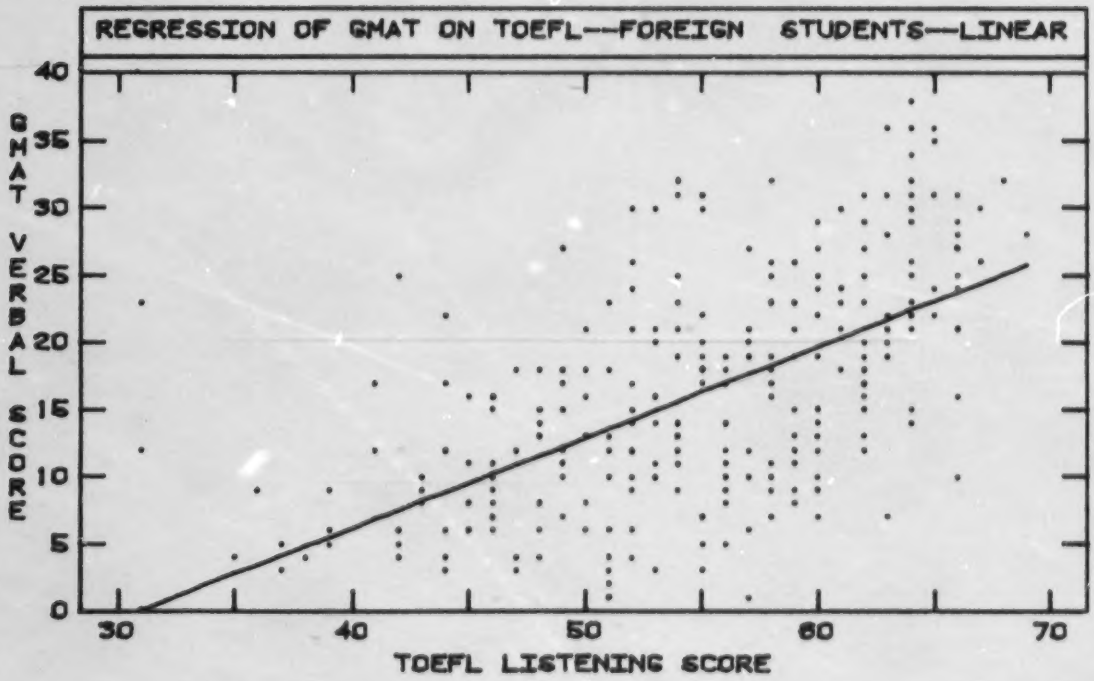


Figure B-4

Regression of GMAT Verbal Score on TOEFL Listening Comprehension Score (Quadratic)

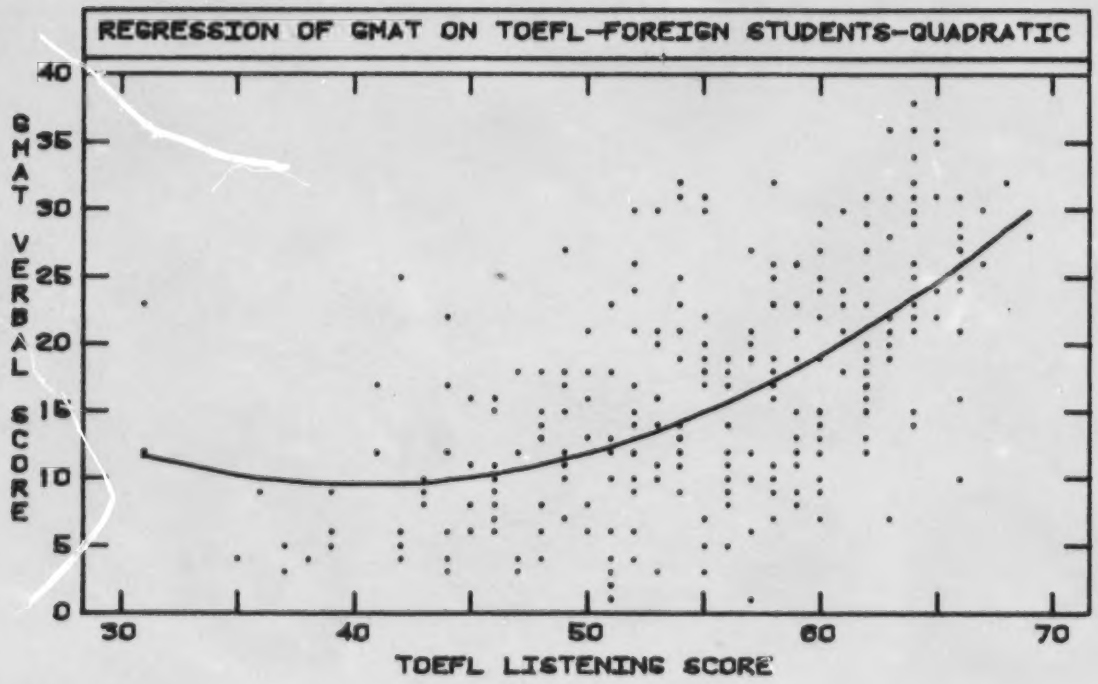


Figure B-5

Regression of GMAT Verbal Score on TOEFL Structure and Written Expression Score (Linear)

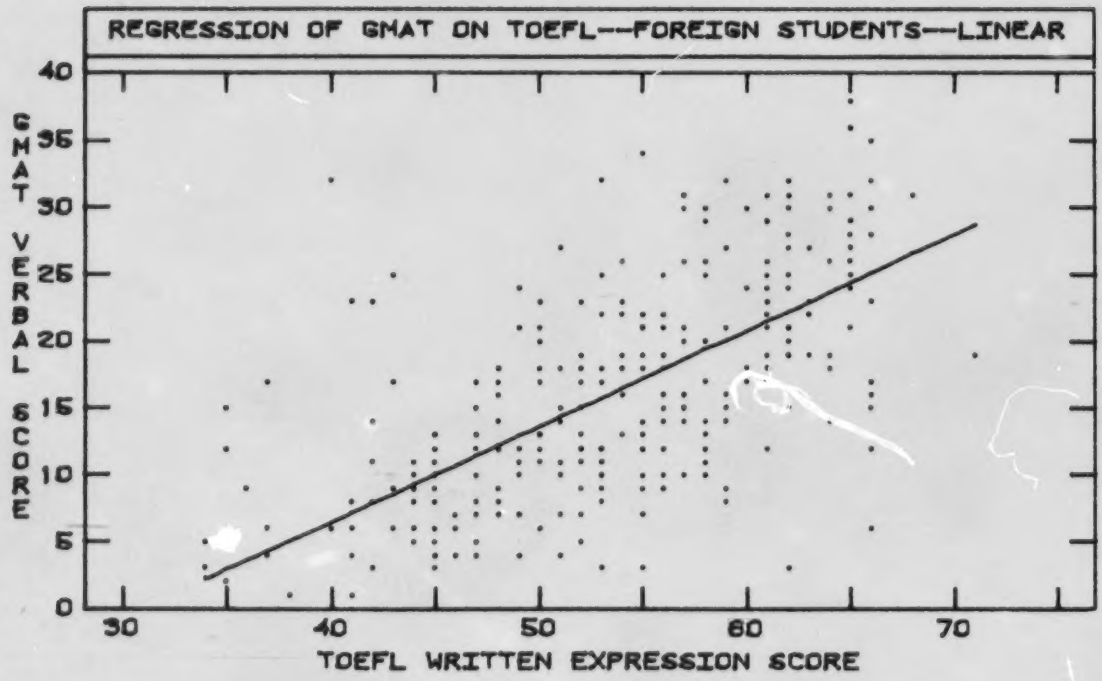


Figure B-6

Regression of GMAT Verbal Score on TOEFL Structure and Written Expression Score (Quadratic)

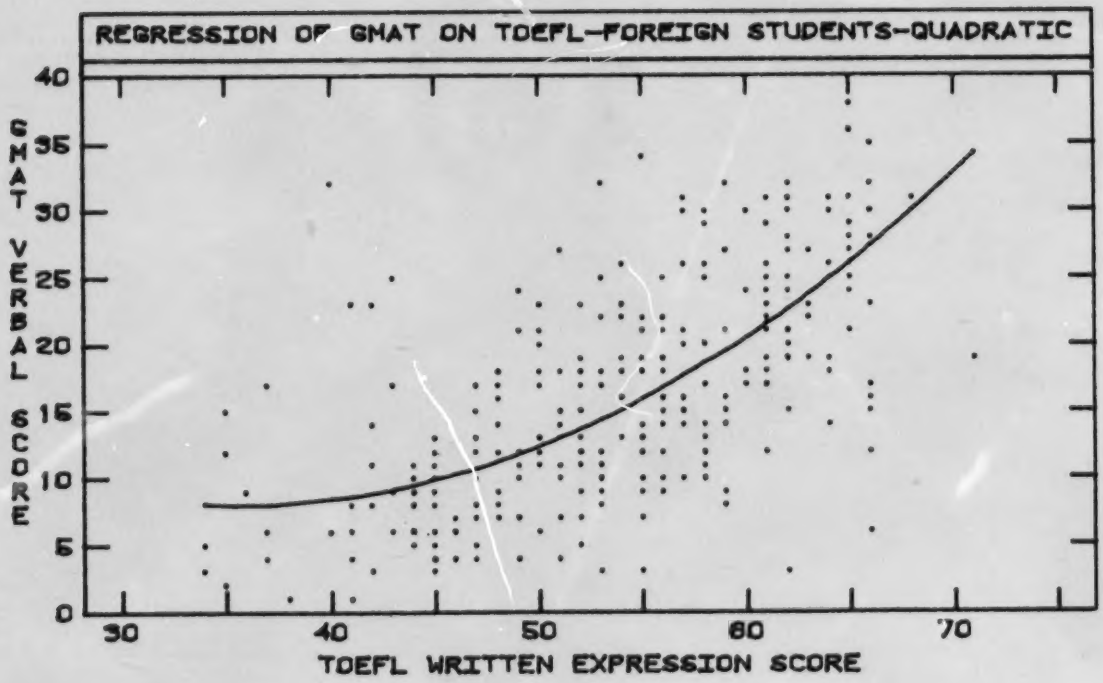


Figure B-7

Regression of GMAT Verbal Score on TOEFL Reading Comprehension Score (Linear)

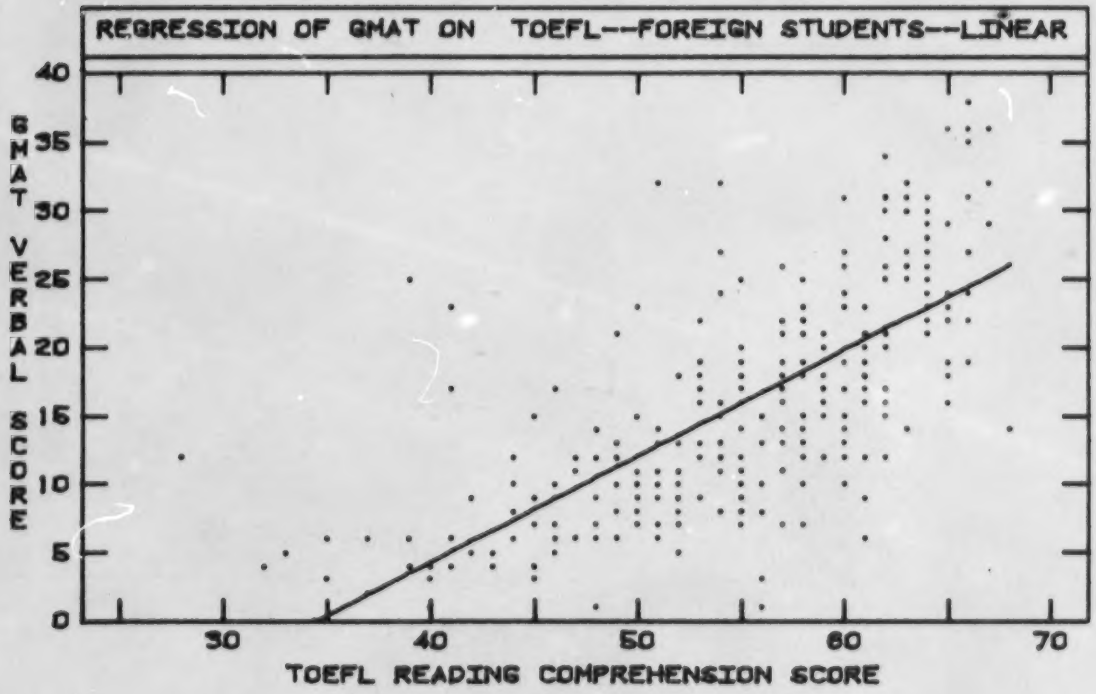
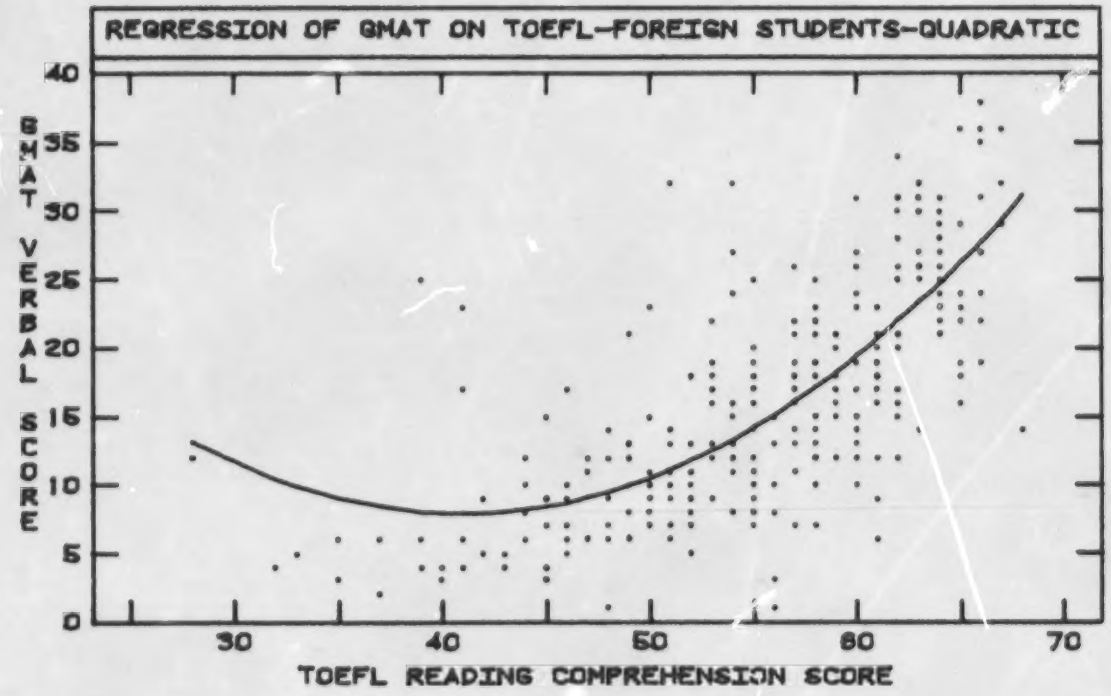


Figure B-8

Regression of GMAT Verbal Score on TOEFL Reading Comprehension Score (Quadratic)



Appendix C

Plots of Linear and Quadratic Regressions of
GMAT-Quantitative Scores on TOEFL Scores for All Candidates

Figure C-1

Regression of GMAT Quantitative Score on TOEFL Total Score (Linear)

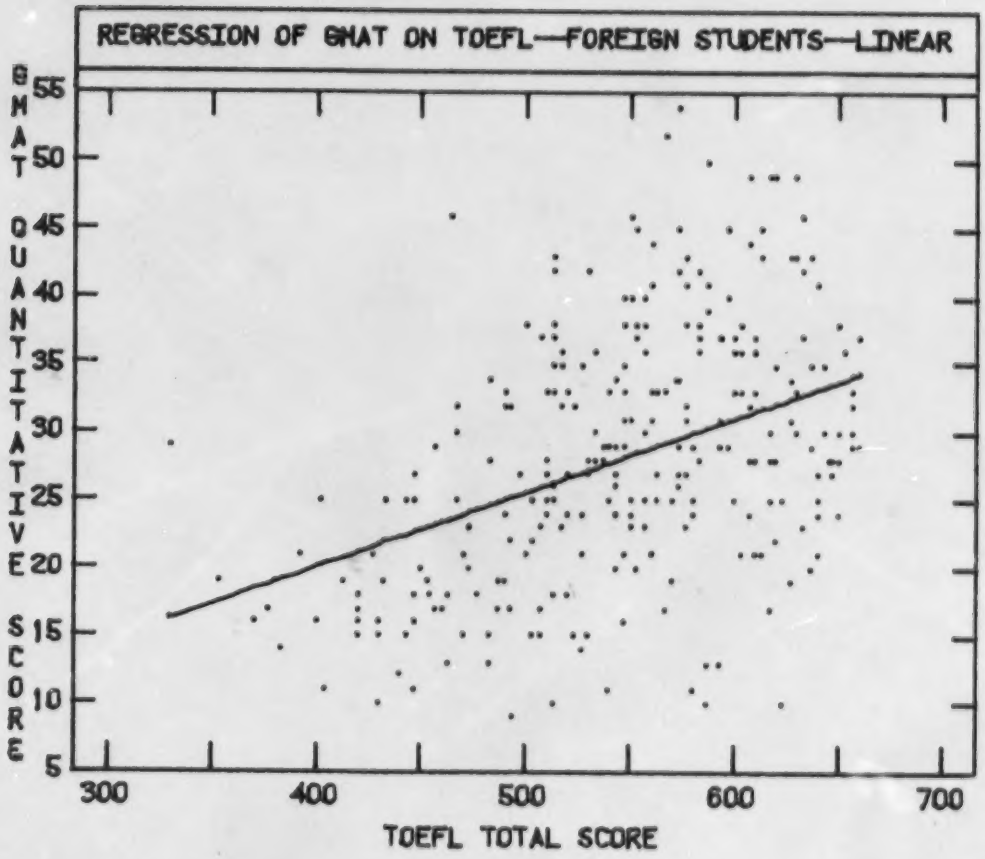


Figure C-2

Regression of GMAT Quantitative Score on TOEFL Total Score (Quadratic)

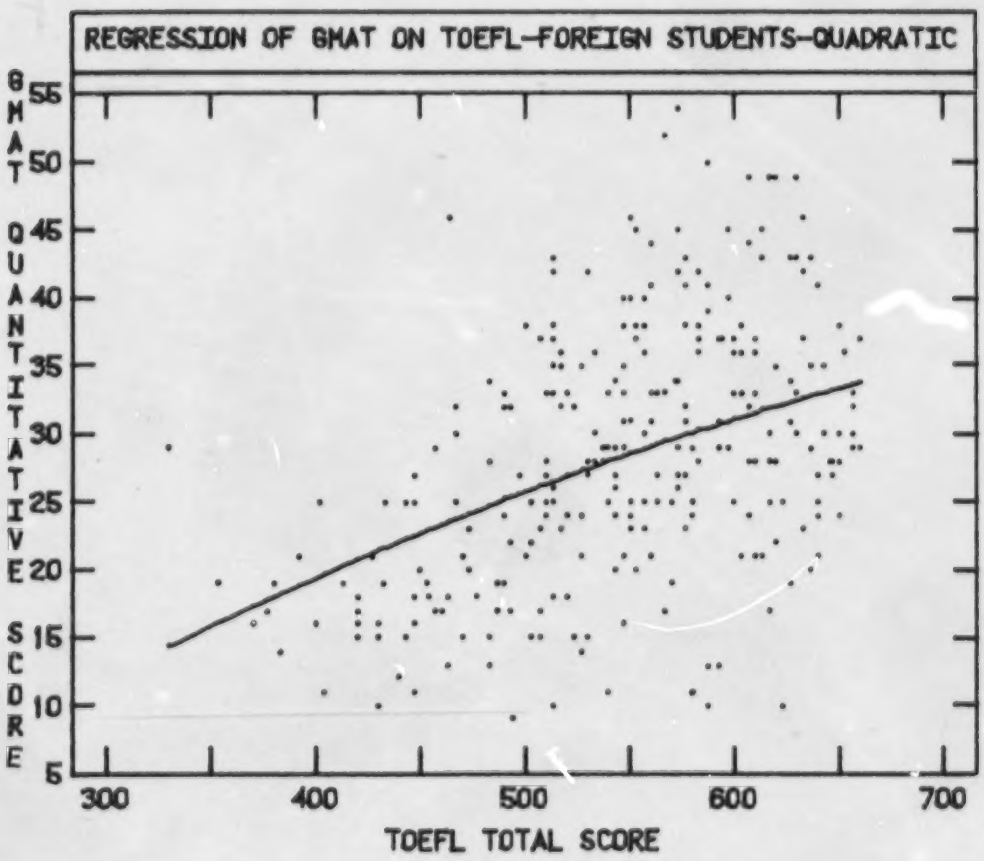


Figure C-3

Regression of GMAT Quantitative Score on TOEFL
Listening Comprehension Score (Linear)

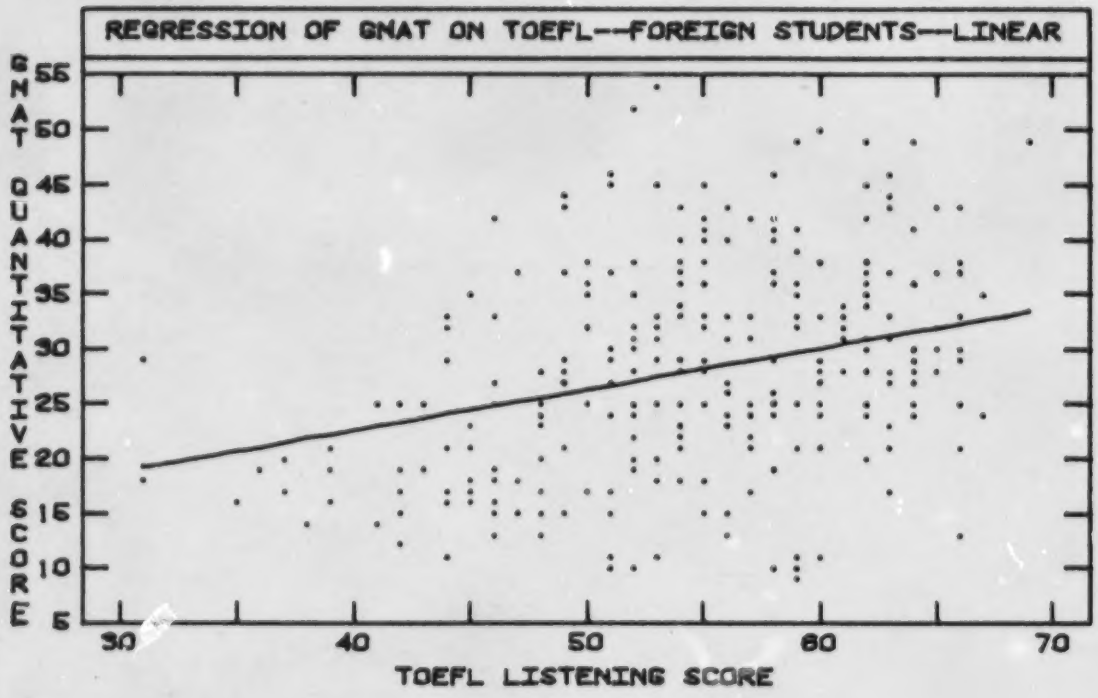


Figure C-4

Regression of GMAT Quantitative Score on TOEFL Listening Comprehension Score (Quadratic)

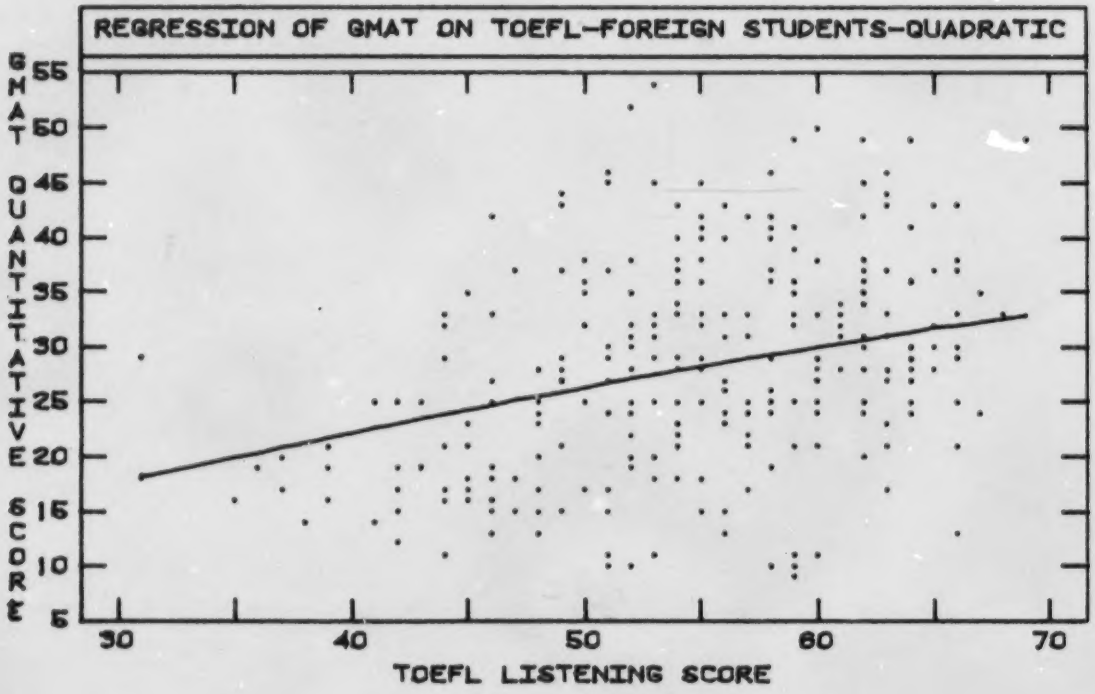


Figure C-5

Regression of GMAT Quantitative Score on TOEFL
Structure and Written Expression Score (Linear)

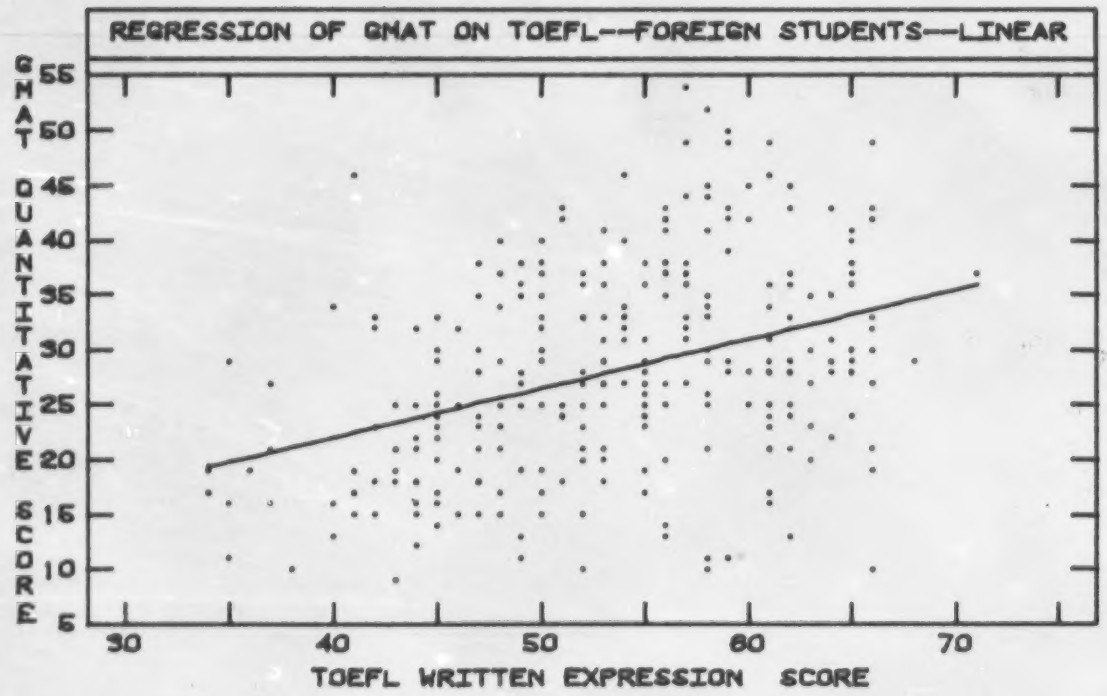


Figure C-6

Regression of GMAT Quantitative Score on TOEFL
Structure and Written Expression Score (Quadratic)

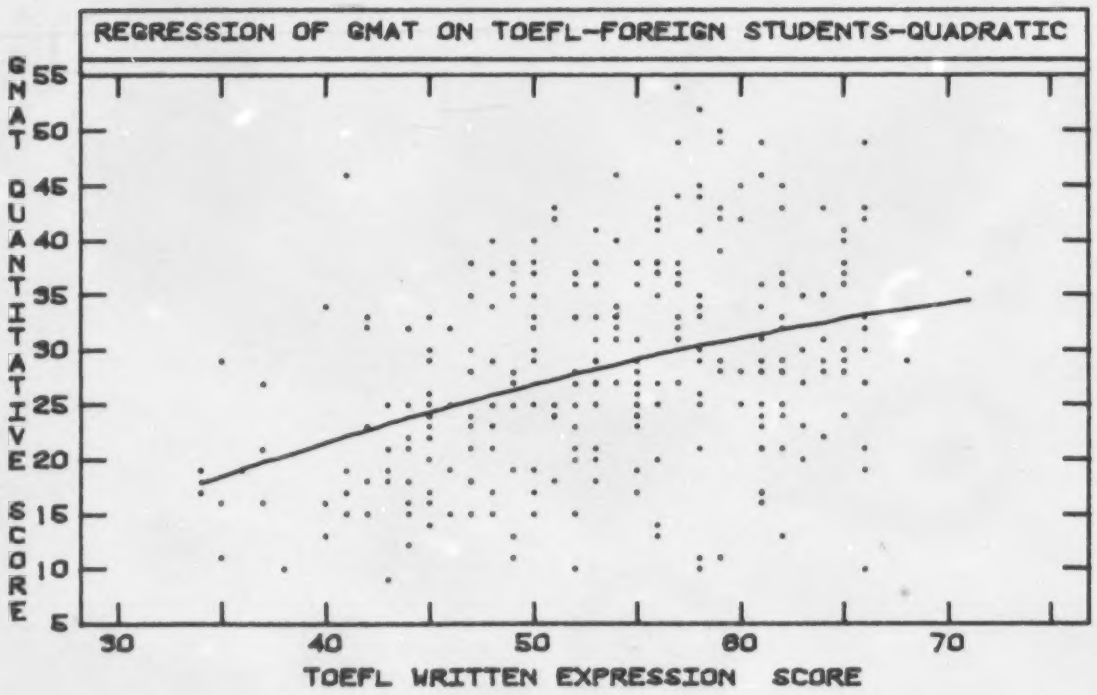


Figure C-7

Regression of GMAT Quantitative Score on TOEFL
Reading Comprehension Score (Linear)

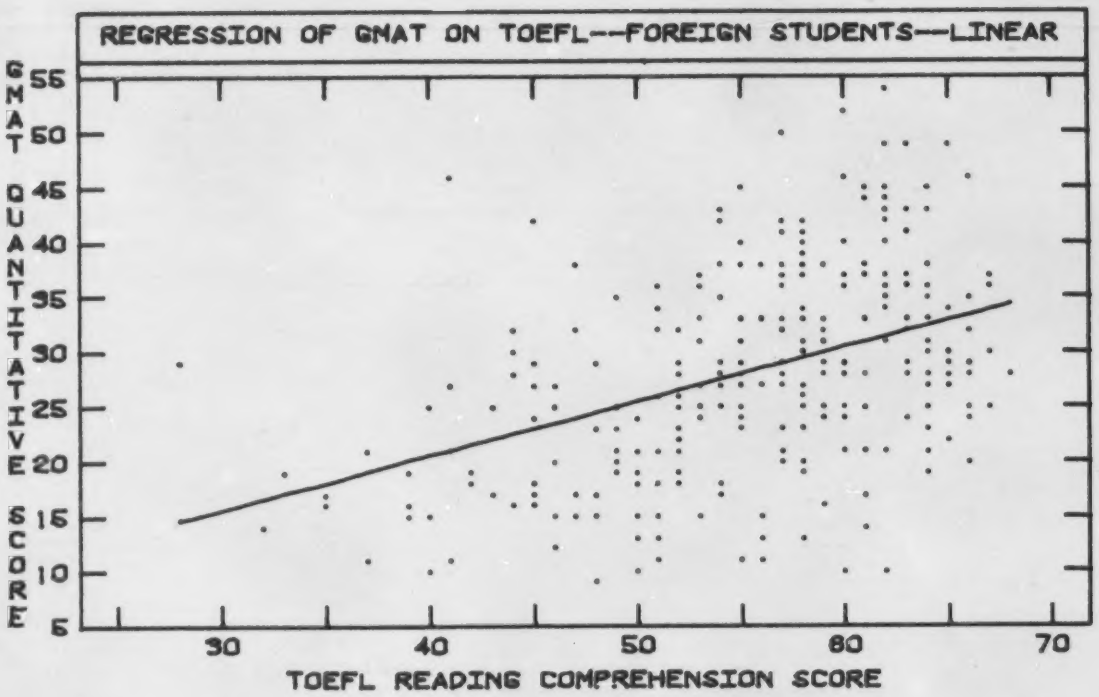
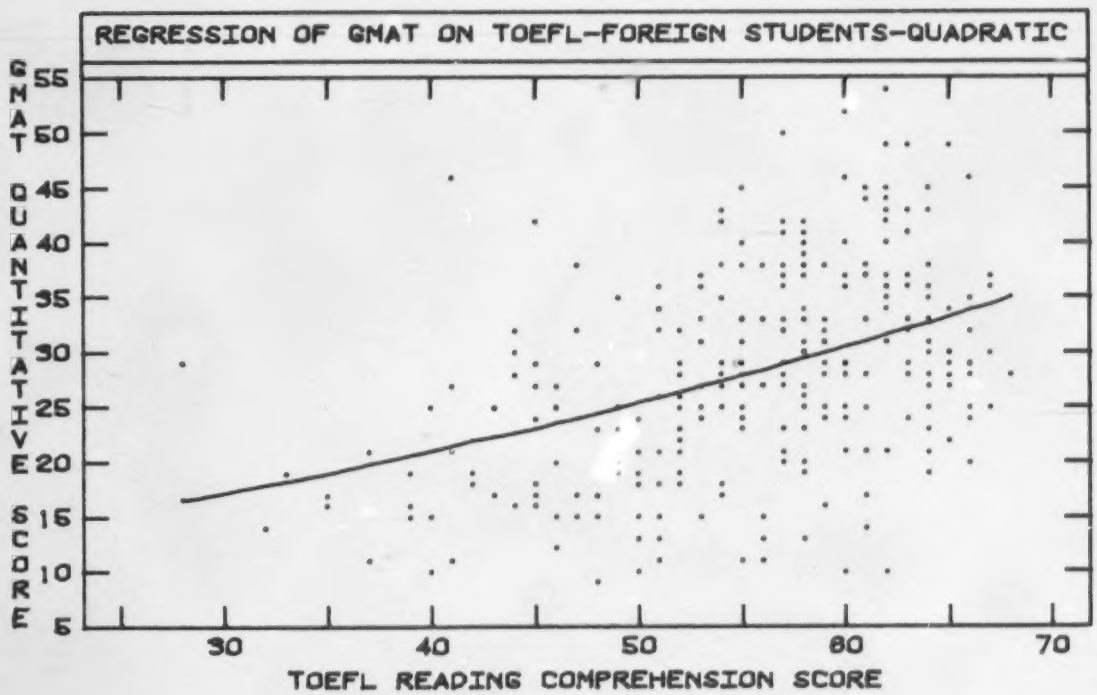


Figure C-8

Regression of GMAT Quantitative Score on TOEFL Reading Comprehension Score (Quadratic)

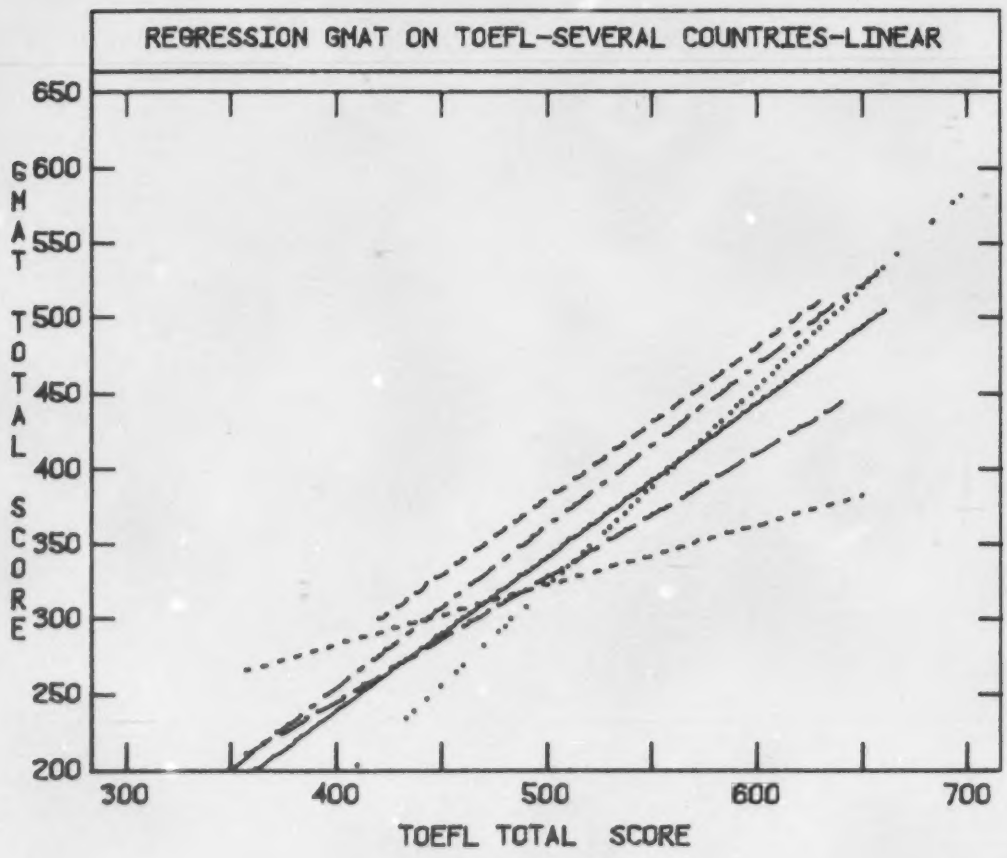


Appendix D

Plots of Linear and Quadratic Regressions of GMAT-Total Scores on TOEFL Scores for Several Countries

Figure D-1

Regression of GMAT Total Score on TOEFL Total Score
for Several Countries (Linear)

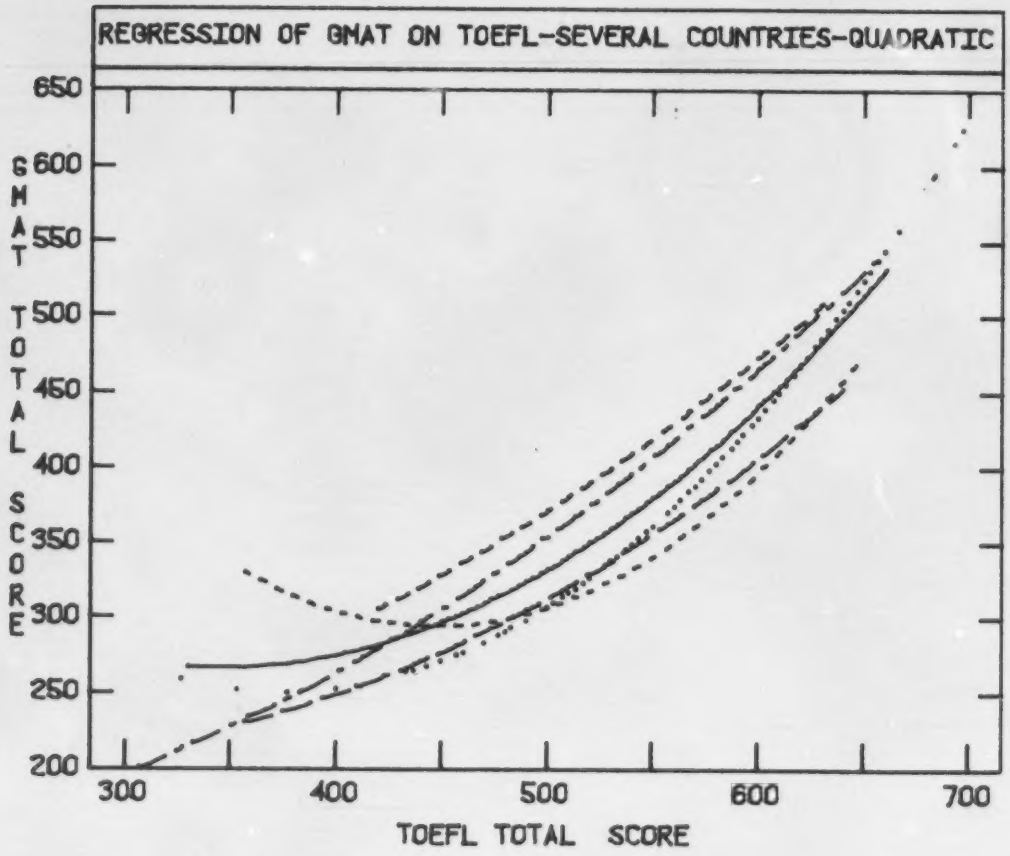


Legend

——— All Countries
..... India
- - - - - - - Iran
— - — - — Japan
— — — — Thailand
- - - - - Taiwan

Figure D-2

Regression of GMAT Total Score on TOEFL Total Score
for Several Countries (Quadratic)

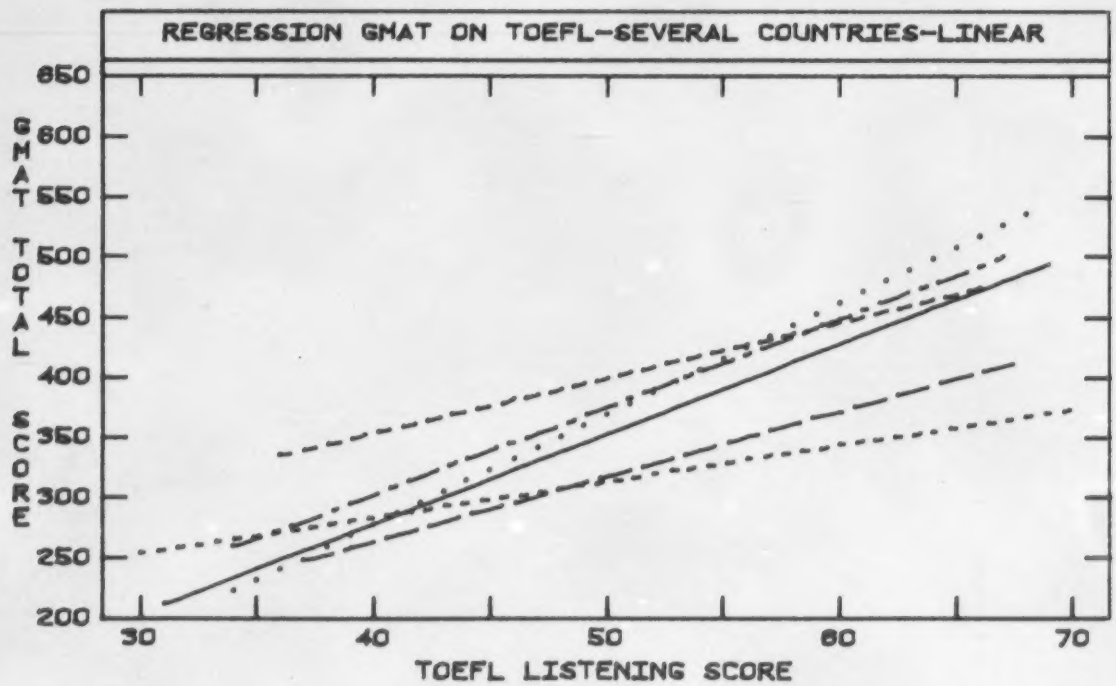


Legend

——— All Countries
..... India
------- Iran
—·—·— Japan
— — — Thailand
- - - - - Taiwan

Figure D-3

Regression of GMAT Total Score on TOEFL Listening Comprehension Score for Several Countries (Linear)



Legend

——— All Countries

..... India

------- Iran

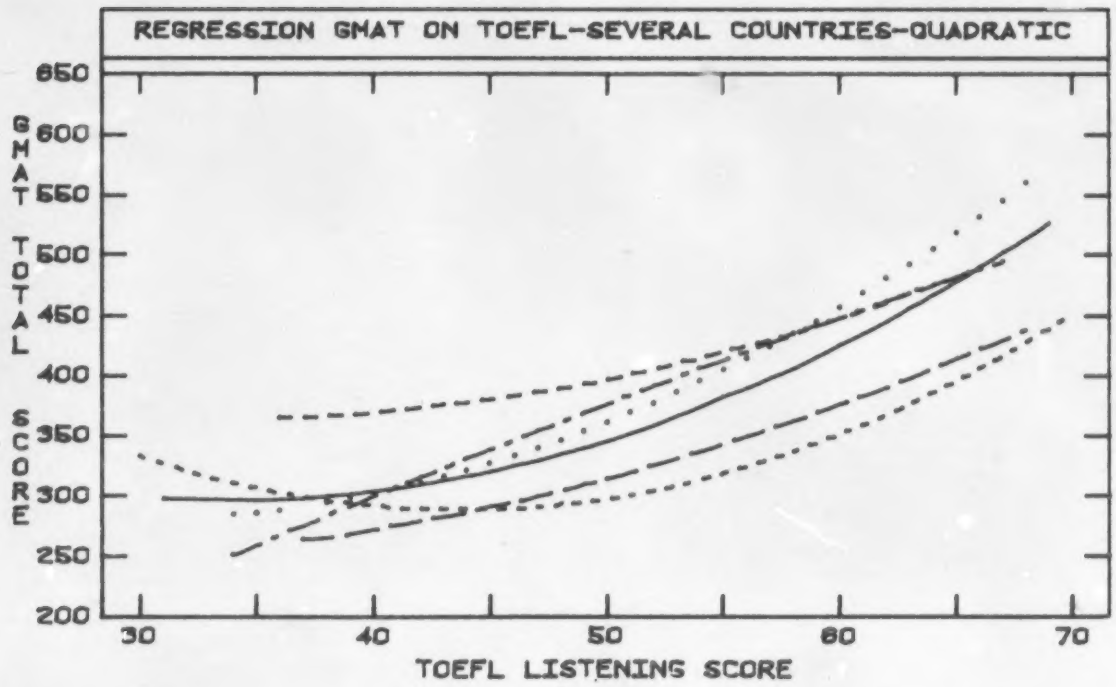
—·—·— Japan

— — — Thailand

- - - - - Taiwan

Figure D-4

Regression of GMAT Total Score on TOEFL Listening Comprehension Score for Several Countries (Quadratic)



Legend

——— All Countries

..... India

------- Iran

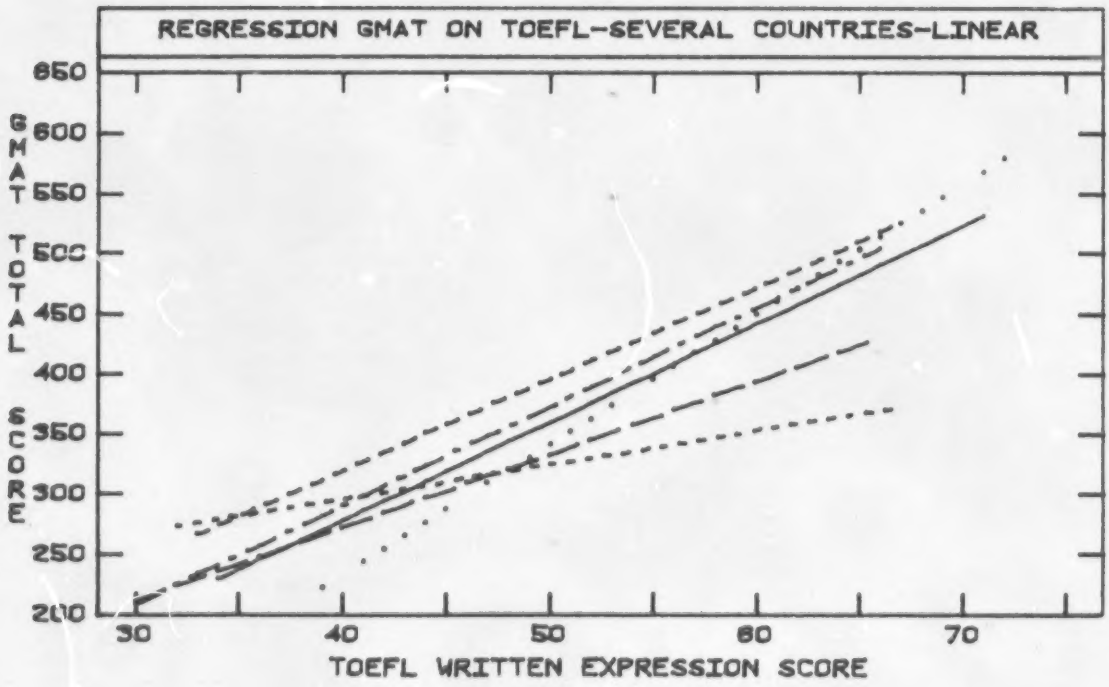
—.—.— Japan

— — — Thailand

- - - - - Taiwan

Figure D-5

Regression of GMAT Total Score on TOEFL Structure and Written Expression Score for Several Countries (Linear)



Legend

——— All Countries

..... India

------- Iran

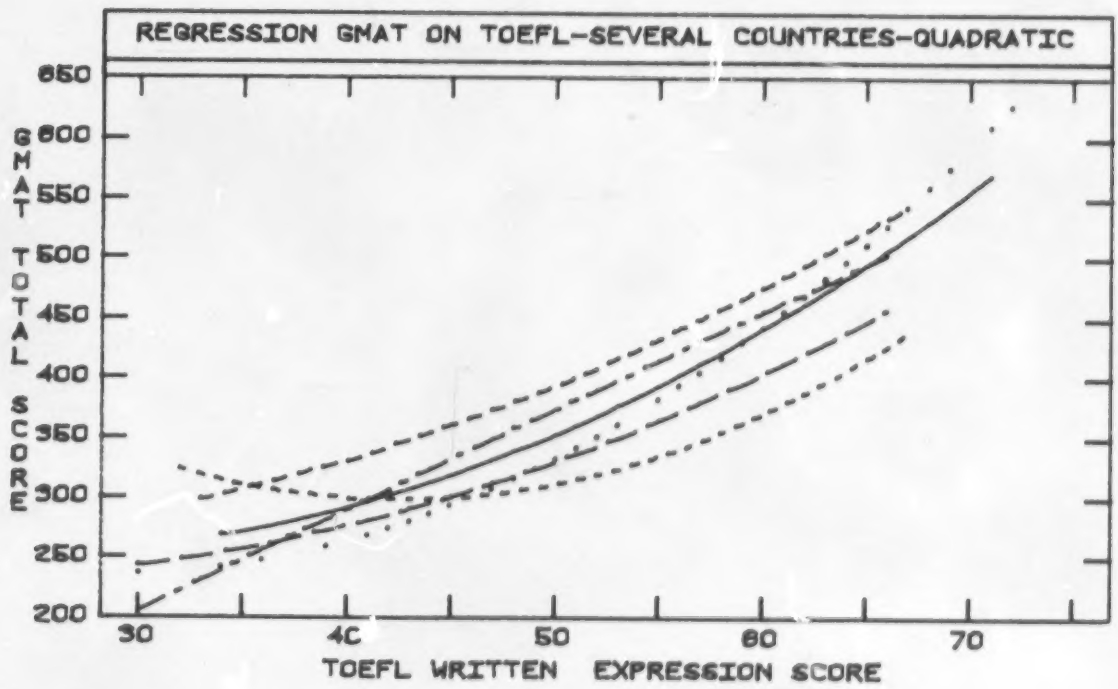
—.—.— Japan

— — — — Thailand

- - - - - Taiwan

Figure D-6

Regression of GMAT Total Score on TOEFL Structure and Written Expression Score for Several Countries (Quadratic)



Legend

——— All Countries

..... India

------- Iran

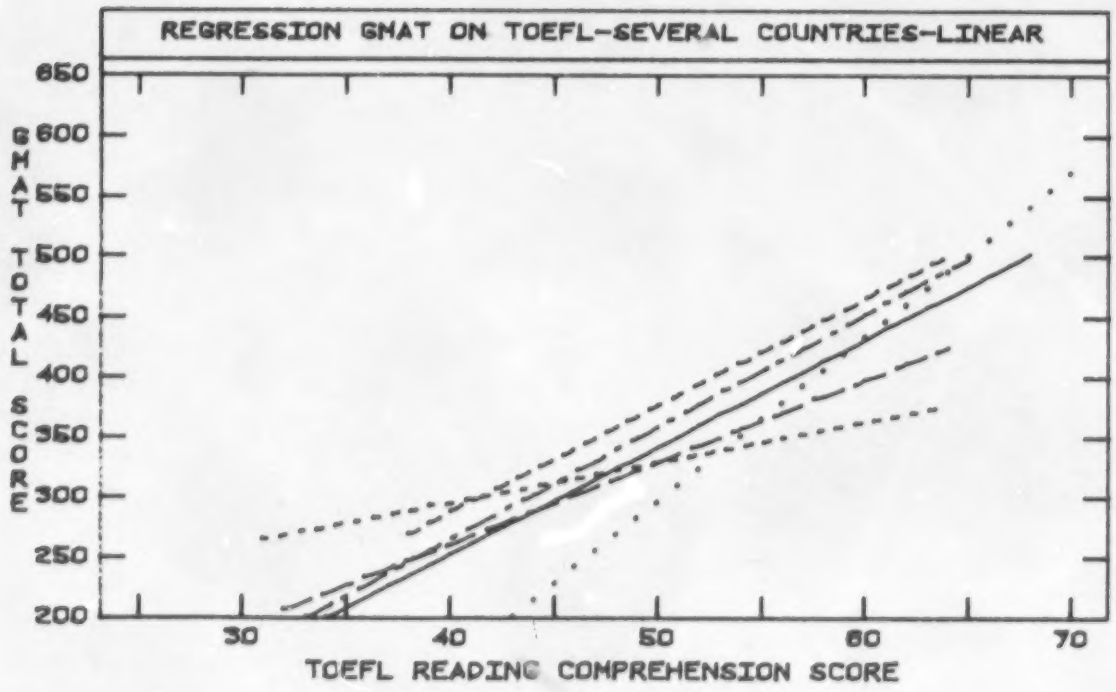
—.—.— Japan

— — — — Thailand

- - - - - Taiwan

Figure D-7

Regression of GMAT Total Score on TOEFL Reading Comprehension Score for Several Countries (Linear)



Legend

——— All Countries

..... India

- - - - - - - Iran

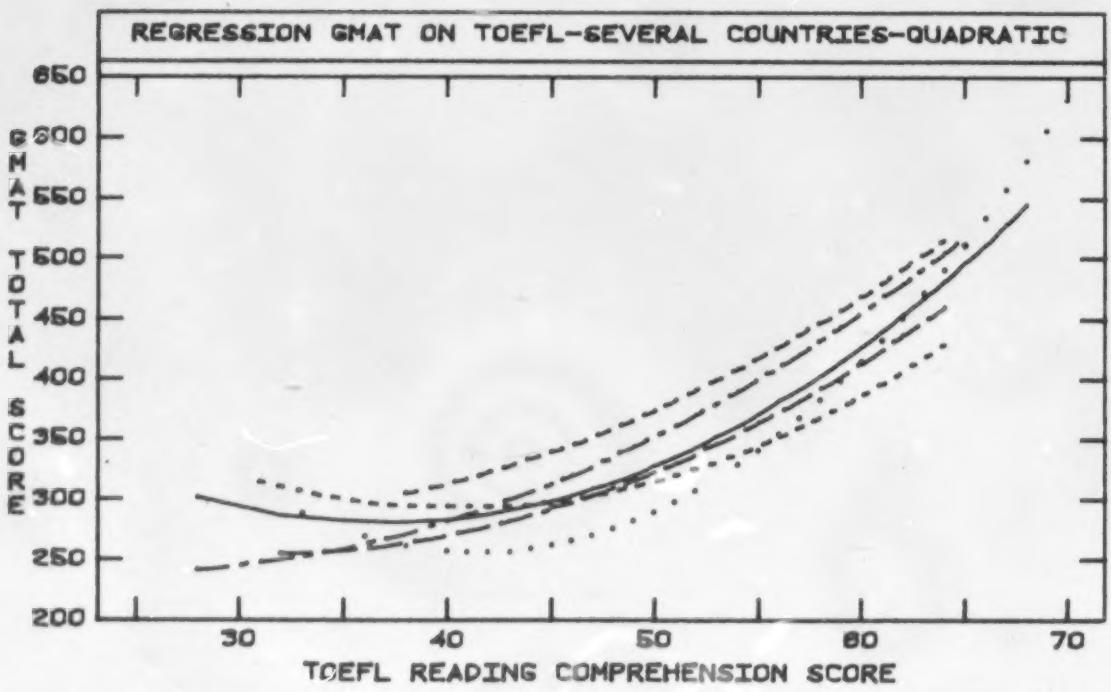
—·—·— Japan

—— —— Thailand

— — — — Taiwan

Figure D-8

Regression of GMAT Total Score on TOEFL Reading Comprehension Score for Several Countries (Quadratic)



Legend

——— All Countries

..... India

------- Iran

—·—·— Japan

— — — — Thailand

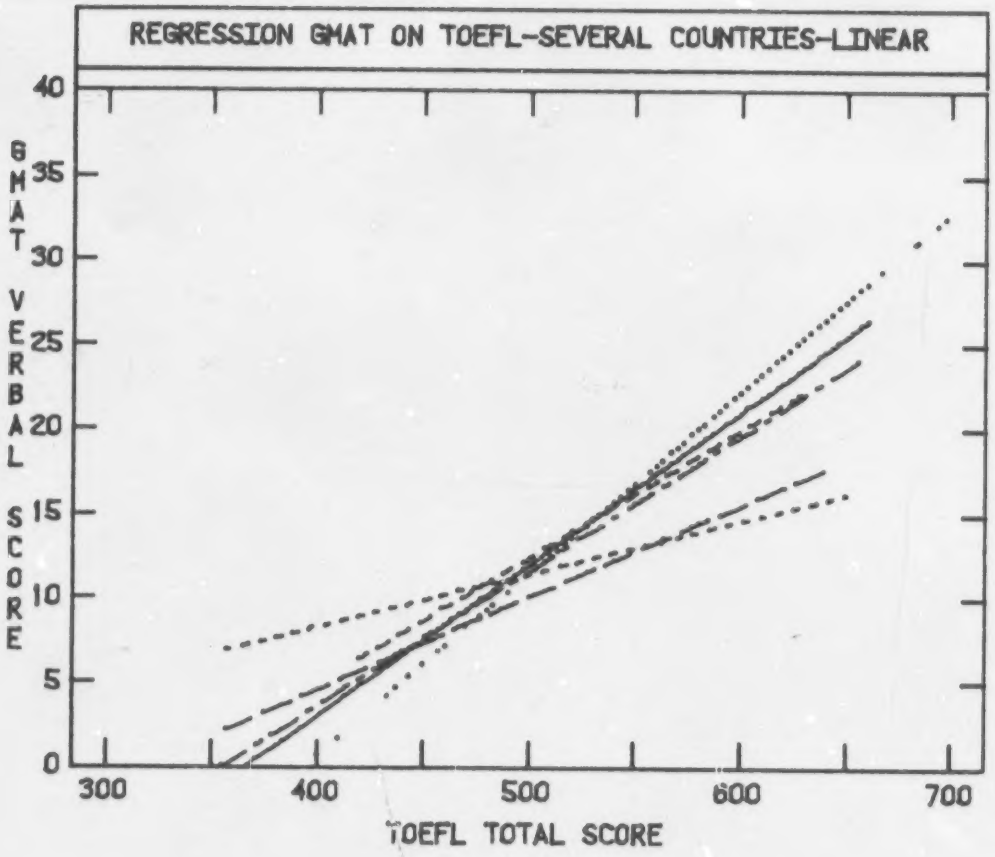
- - - - - Taiwan

Appendix E

Plots of Linear and Quadratic Regressions of
GMAT-Verbal Scores on TOEFL Scores for Several Countries

Figure E-1

Regression of GMAT Verbal Score on TOEFL Total Scores
for Several Countries (Linear)



Legend

All Countries
India
Iran
Japan
Thailand
Taiwan

Figure E-2

Regression of GMAT Verbal Score on TOEFL Total Scores
for Several Countries (Quadratic)

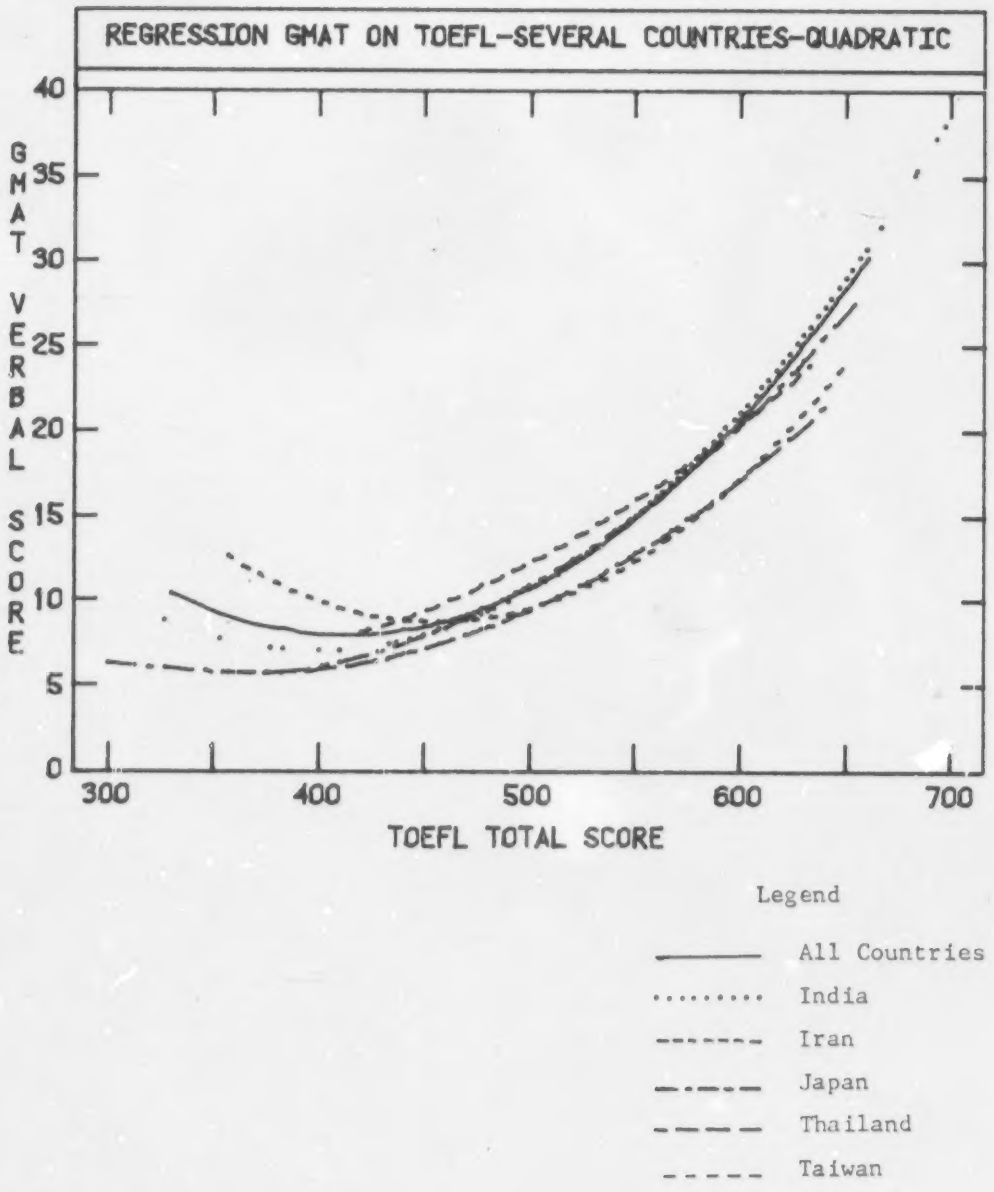
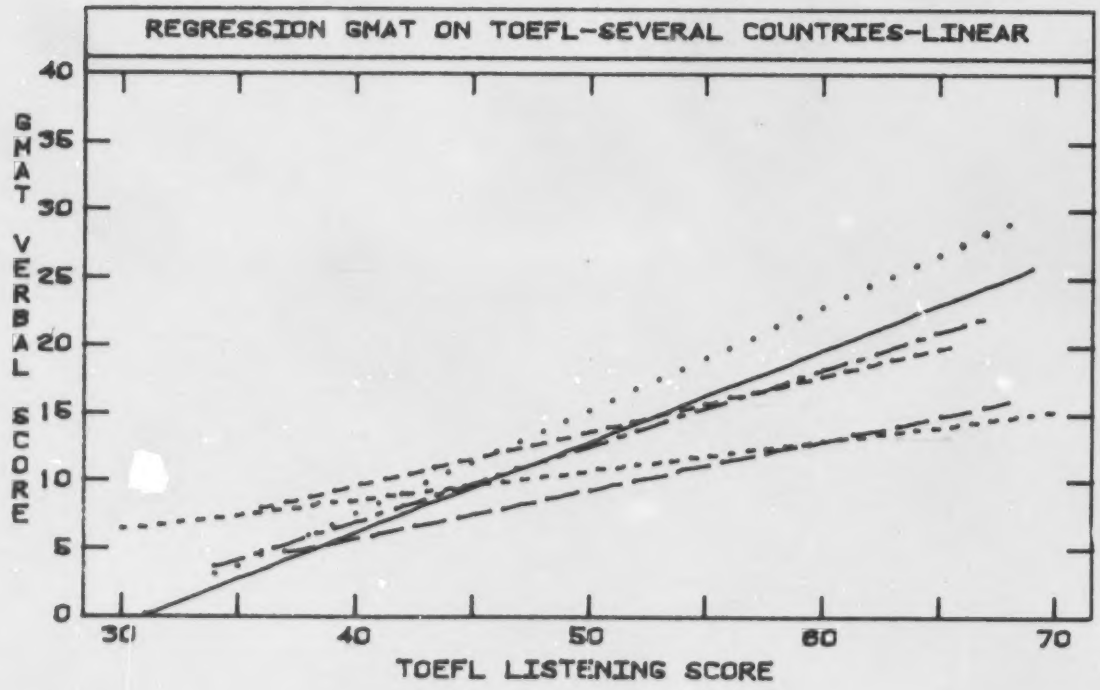


Figure E-3

Regression of GMAT Verbal Score on TOEFL Listening Comprehension Score for Several Countries (Linear)



Legend

——— All Countries

····· India

------ Iran

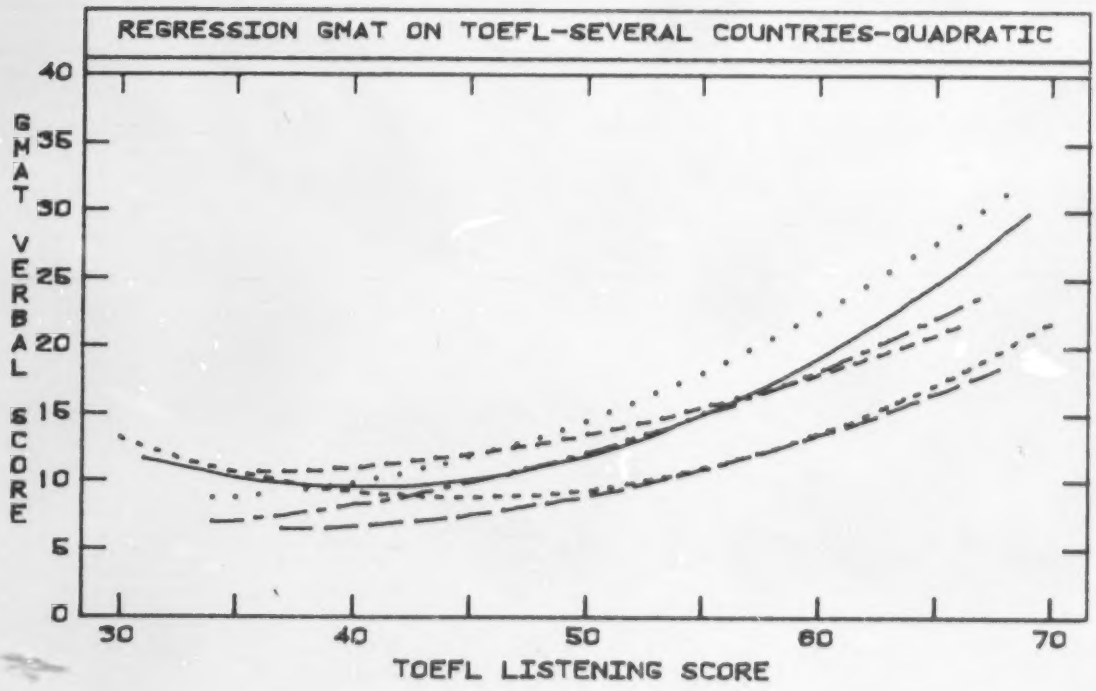
—·—·— Japan

— — — — Thailand

— ·· — ·· — Taiwan

Figure E-4

Regression of GMAT Verbal Score on TOEFL Listening Comprehension Score for Several Countries (Quadratic)



Legend

——— All Countries

····· India

- - - - - - - Iran

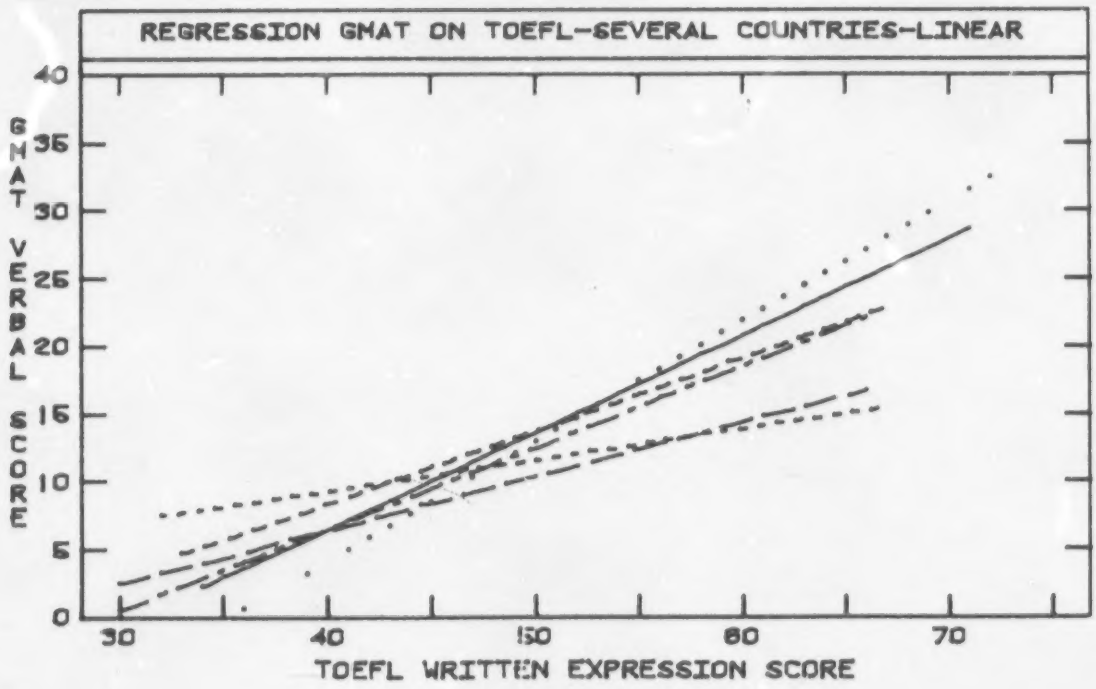
—·—·— Japan

— — — — Thailand

- - - - - Taiwan

Figure E-5

Regression of GMAT Verbal Score on TOEFL Structure and Written Expression Score for Several Countries (Linear)



Legend

——— All Countries

..... India

- - - - - - - Iran

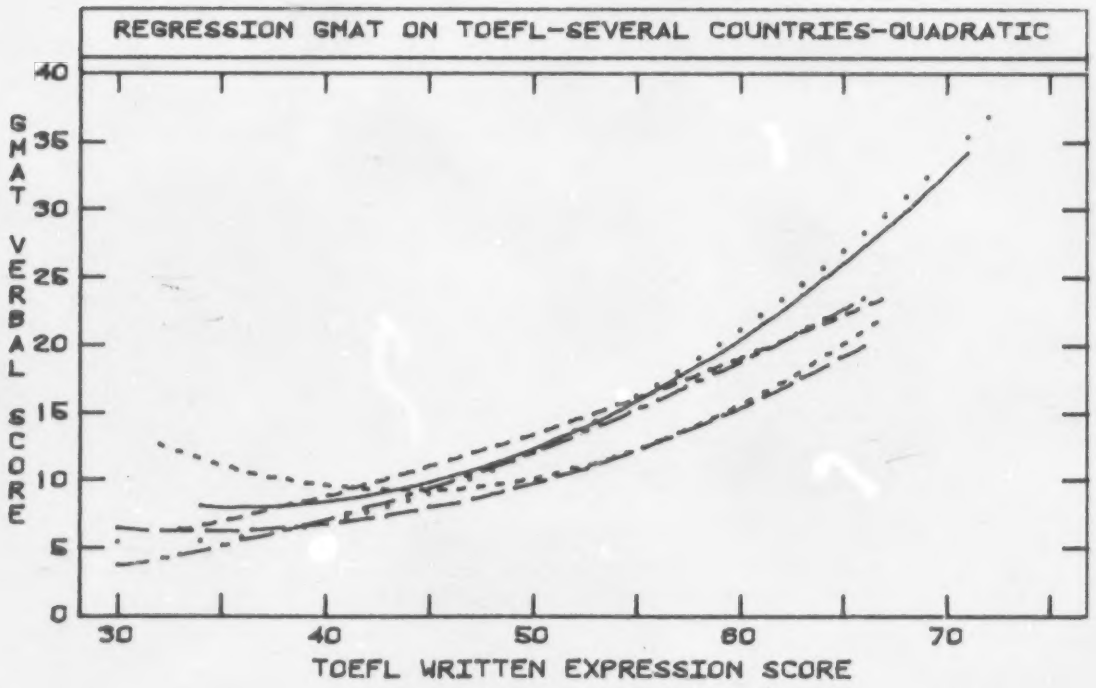
—.—.— Japan

— — — — Thailand

- - - - - Taiwan

Figure E-6

Regression of GMAT Verbal Score on TOEFL Structure and Written Expression Score for Several Countries (Quadratic)



Legend

——— All Countries

..... India

- - - - - - - Iran

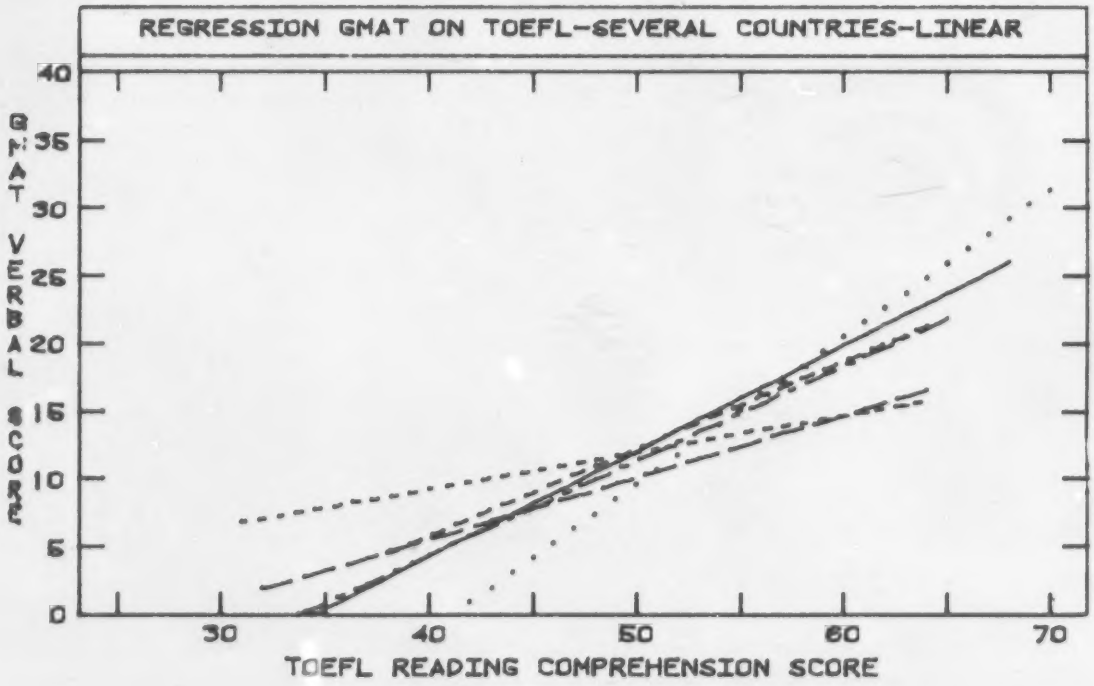
—·—·— Japan

— — — — Thailand

— — — — — Taiwan

Figure E-7

Regression of GMAT Verbal Score on TOEFL Reading Comprehension Score for Several Countries (Linear)



Legend

——— All Countries

..... India

- - - - - - - Iran

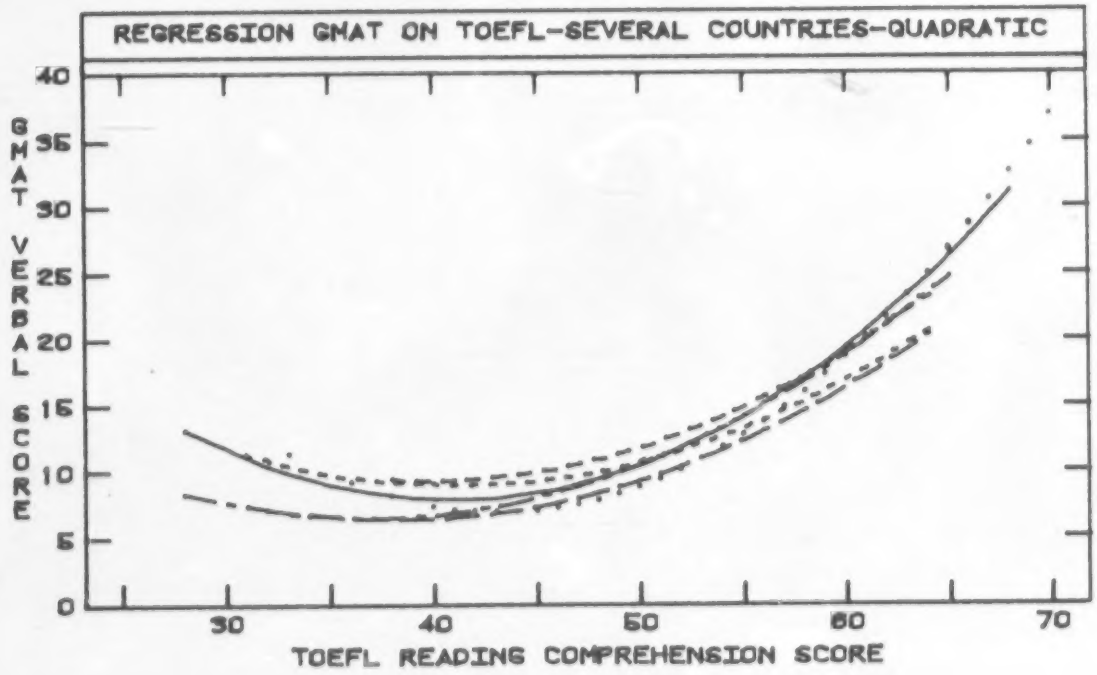
—·—·— Japan

— — — — Thailand

– – – – – Taiwan

Figure E-8

Regression of GMAT Verbal Score on TOEFL Reading Comprehension Score for Several Countries (Quadratic)



Legend

——— All Countries

····· India

------- Iran

—·—·— Japan

— — — — Thailand

- - - - - Taiwan

TOEFL
Research Reports

The Performance of Native Speakers of English on the Test of English as a Foreign Language: Clark, John L.D. Report 1. November 1977.

Discusses the results of the administration of TOEFL to native speakers of English just prior to their graduation from a college-preparatory high school program. Total test score distributions were highly negatively skewed, reinforcing findings of earlier studies that TOEFL is not psychometrically appropriate for discriminating among native speakers of English with respect to English language competence.

An Evaluation of Alternative Item Formats for Testing English as a Foreign Language: Pike, Lewis W. Report 2. June 1979.

Describes an extensive research study conducted from 1972 to 1974 that was designed to explore possible changes in the format and content of TOEFL. Questions of validation, criterion selection, and content specifications were investigated. The report includes the results of these findings and discusses the implications for TOEFL content specifications and internal structure. This study contributed to the restructuring of TOEFL beginning in 1976.

The Performance of Non-Native Speakers of English on TOEFL and Verbal Aptitude Tests: Angelis, Paul J.; Swinton, Spencer S.; and Cowell, William R. Report 3. October 1979.

Gives the results of a study in which 400 graduate and undergraduate applicants took TOEFL, the GRE Verbal or the SAT Verbal, and the Test of Standard Written English (TSWE). Included in the report are comparative data on performance across tests and interpretive information on how combined test results might best be used in the admission process.

An Exploration of Speaking Proficiency Measures in the TOEFL Context: Clark, John L.D., and Swinton, Spencer S. Report 4. October 1979.

Describes a three-year study involving the development and experimental administration of test formats and item types aimed at measuring the English-speaking proficiency of nonnative speakers. Factor analysis and other techniques were used to identify subsets of item formats and individual items having satisfactory correlations with the Foreign Service Institute criterion interview administered to the test subjects. The results were grouped into a prototype "Test of Spoken English."

The Relationship between Scores on the Graduate Management Admission Test and the Test of English as a Foreign Language: Powers, Donald E. Report 5. December 1980.

Summarizes analyses indicating performance of 6,000 nonnative speakers of English on TOEFL and GMAT. In addition to comparisons between native and nonnative speakers, data are included showing performance by language background. A variety of analyses support the basic differences in the two tests by showing expected GMAT verbal scores for various levels of TOEFL scores.

Factor Analysis of the Test of English as a Foreign Language for Several Language Groups: Powers, Donald E., and Swinton, Spencer S. Report 6. December 1980.

Provides evidence from a set of exploratory analytical techniques that three major factors underlie performance on TOEFL. Some support is also found for concluding that these factors may be interpreted differently for several language groups. The report discusses implications for making inferences based on TOEFL subscores and considerations for future test development.

The Test of Spoken English as a Measure of Communicative Ability in English-Medium Instructional Settings: Clark, John L.D., and Swinton, Spencer S. Report 7. December 1980.

Presents the results of a study that examined the performance of foreign teaching assistants on the Test of Spoken English in relation to their classroom performance as judged by students. Also includes, for purposes of comparison, data showing performance of the same groups of teaching assistants on the Foreign Service oral interview and on TOEFL. Based on the analyses conducted in the study, TSE is shown to be a valid predictor of language abilities for nonnative English-speaking graduate teaching assistants.

Effects of Item Disclosure on TOEFL Performance: Angelis, Paul J.; Hale, Gordon A.; and Thibodeau, Lawrence A. Report 8. December 1980.

Reports the findings of a study designed to examine the effects of performance on TOEFL when a subset of items have been disclosed prior to an administration. Based on data from 16 intensive English training programs, the results indicate significant increases in performance in proportion to the number of items made available to students. Details are provided showing separate results by language group and by item type.

The above reports are currently available. Other research reports are planned. For further information about any of the TOEFL Research Reports, write to:

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Box 899
Princeton, NJ 08541, USA